

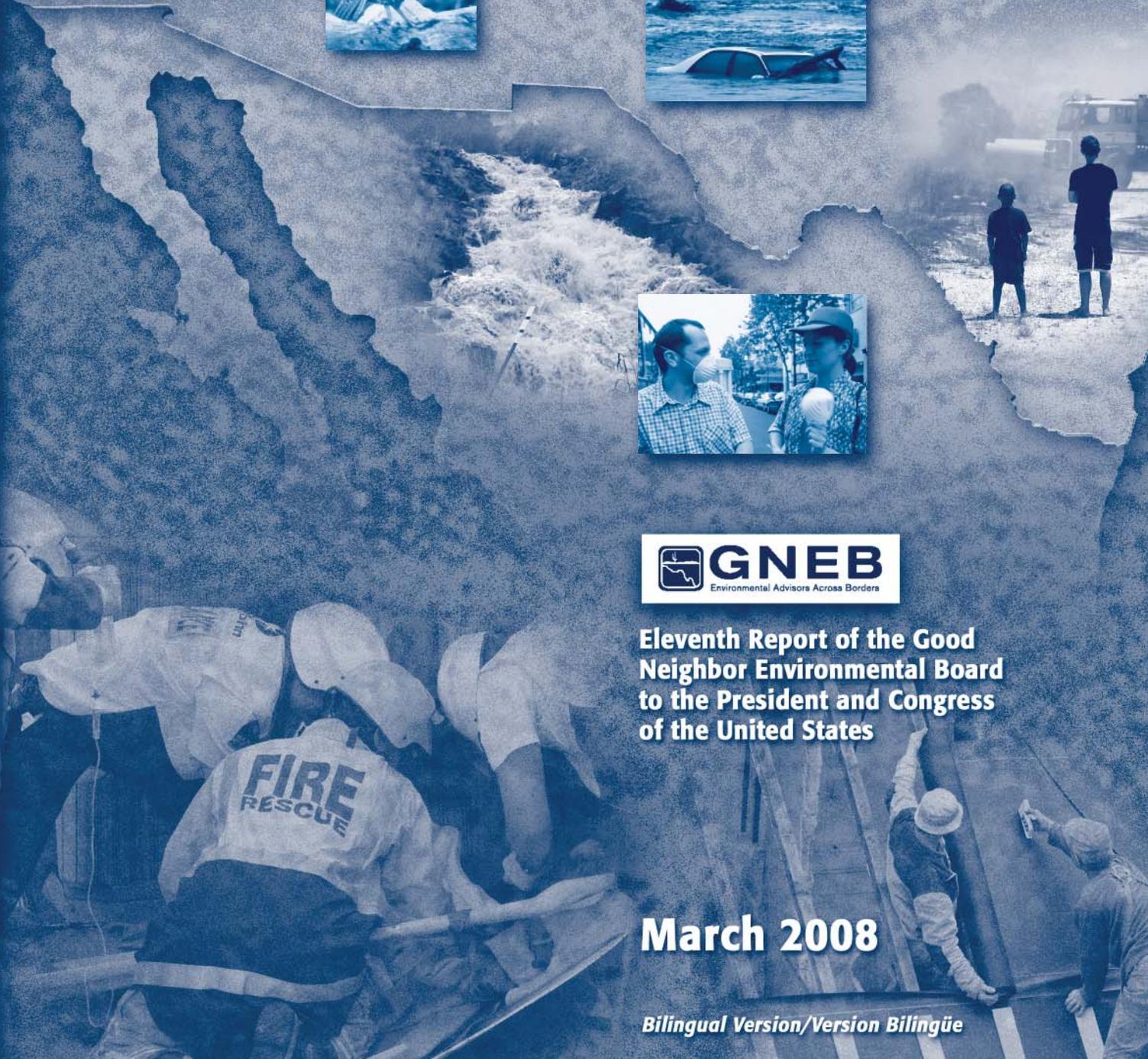
NATURAL DISASTERS AND THE ENVIRONMENT ALONG THE U.S.-MEXICO BORDER



Eleventh Report of the Good Neighbor Environmental Board to the President and Congress of the United States

March 2008

Bilingual Version/Version Bilingüe



About the Board

The Good Neighbor Environmental Board is an independent U.S. Presidential advisory committee that was created in 1992 under the Enterprise for the Americas Initiative Act, Public Law 102-532. It operates under the Federal Advisory Committee Act (FACA), and its mission is to advise the President and Congress of the United States on “good neighbor” environmental and infrastructure practices along the U.S. border with Mexico. The Board does not carry out border-region environmental activities of its own, nor does it have a budget to fund border projects. Rather, its unique role is to step back as an expert, nonpartisan advisor to the President and Congress and recommend how the federal government can most effectively work with its many partners to improve the environment along the U.S.-Mexico border. Under Presidential Executive Order 12916, its administrative activities were assigned to the U.S. Environmental Protection Agency (EPA) and are carried out by the EPA Office of Cooperative Environmental Management (OCEM).

Membership on the Board is extremely diverse. It includes senior officials from a number of U.S. federal government agencies and from each of the four U.S. border states—Arizona, California, New Mexico, and Texas. It also includes representatives from the tribal, local government, nonprofit, ranching and grazing, business, and academic sectors. In addition, the Board maintains dialogue with its counterpart Mexican environmental agency advisory groups and the Consejos Consultivos para el Desarrollo Sustentable (CCDS)—referred to as Consejos—to help ensure that it remains informed about issues on the Mexico side of the border.

The Board meets twice each calendar year in various U.S. border communities and once in Washington, DC. Its advice is submitted to the U.S. President and Congress in the form of annual reports that contain recommendations for action. These recommendations are submitted after consensus is reached across the entire membership. They are shaped by the combined expertise of the Board members, by the Board’s ongoing dialogue with its Consejo counterpart groups, and by the speakers and concerned citizens from both sides of the border who attend its meetings in border communities. The Board also occasionally issues Comment Letters during the year to provide input on timely topics. One of the most frequently recurring themes in its advice is that support for cross-border cooperation is essential if sustained progress is to be made on environmental issues along the U.S.-Mexico border.

All meetings of the Good Neighbor Environmental Board are open to the public. For more information, see the Board Web Site, <http://www.epa.gov/ocem/gneb>, or contact EPA OCEM at 202-564-2294.

Notice: This report was written to fulfill the mission of the Good Neighbor Environmental Board (the Board); a public advisory committee authorized under Section 6 of the Enterprise for the Americas initiative Act, 7 USC, Section 5404. It is the Board’s Eleventh Report to the President and Congress of the United States. EPA manages the operations of the Board. This report, however, has not been reviewed for approval by EPA and, hence, the report’s contents and recommendations do not necessarily represent the views and policies of EPA, nor of other agencies in the Executive Branch of the federal government, nor does mention of trade names or commercial products constitute a recommendation for use.

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**GOOD NEIGHBOR
ENVIRONMENTAL BOARD**

*Independent Presidential advisory committee
on environmental and infrastructure issues
along the U.S. border with Mexico*

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March 19, 2008

The President
The Vice President
The Speaker of the House of Representatives

On behalf of the Good Neighbor Environmental Board, your advisor on environmental and infrastructure conditions along the U.S. border with Mexico, I am pleased to submit to you the *Eleventh Report of the Good Neighbor Environmental Board to the President and Congress of the United States*.

This year, the report focuses on the environmental effects of natural disasters that occur along the border. Examples include hurricanes, mudslides, tornadoes, wildfires, and earthquakes. We divided our findings into three sections. Section 1 details the effects of natural disasters on the region's environment, including effects on human health as well as wildlife and ecosystems. It also examines how specific population groups such as tribes and families living in unincorporated communities (colonias) are affected. Section 2 looks at the capabilities of existing institutions and frameworks to manage natural disasters along the border. Section 3 highlights promising emergency management initiatives that already incorporate natural disaster management or could be expanded to do so.

Recommendations in this year's report call for federal policymakers to concentrate on four areas when working with other authorities to manage natural disasters along the U.S.-Mexico border:

(1) Support local initiatives to implement appropriate zoning codes, building codes, and other types of strategic planning. (2) Build capacity for transboundary cooperation when responding to natural disasters, as well as cooperation at the local, state, regional, and tribal levels. (3) Better integrate existing emergency management systems and practical exercises, including ensuring that they cover natural disasters as well as hazardous materials emergencies. (4) Expand current domestic and international agreements so that they reflect the need for border-specific measures to effectively manage natural disasters.

We appreciate the opportunity to provide these recommendations to you in this, our Eleventh Report, and respectfully request a response. In addition, we welcome continued dialogue on implementation of our advice.

Respectfully yours,

Paul Ganster, Chair

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NATURAL DISASTERS AND THE ENVIRONMENT ALONG THE U.S.-MEXICO BORDER

▶ RECOMMENDATIONS AT A GLANCE ◀

To effectively protect human health and the environment within the U.S.-Mexico border region from natural disasters, the Good Neighbor Environmental Board recommends that the federal government work with appropriate authorities to implement the following policy options:

- 1** Prevent or minimize the impacts of natural disasters through appropriate zoning codes, building codes, landscape requirements, watershed management, and municipal strategic planning.
- 2** Build capacity at the local, state, regional, and tribal levels to effectively manage natural disasters, including cross-border coordination.
- 3** Better integrate current disparate preparedness and response management systems and practical exercises so as to cover all types of emergencies, including natural disasters.
- 4** Expand existing domestic and binational agreements to incorporate U.S.-Mexico border-specific measures related to natural disasters, including measures tailored to specific natural features and human settlements.

Introduction

Hurricane Katrina struck in August 2005, followed shortly by Hurricane Rita. One of the most sobering lessons learned was the need for more strategic preparation and response to natural disasters at all levels, particularly in terms of adequately protecting vulnerable populations.

The U.S.-Mexico border region provides a compelling example of what may, and sometimes has, occurred when vulnerable populations are not prepared for natural disasters. The region's vulnerability takes several forms. First, a local incident in the border region can quickly become an international incident. Extreme weather events such as hurricanes, floods, tornadoes, wildfires, earthquakes, and mudslides do not respect administrative boundaries. Unlike nonborder communities, residents of the U.S.-Mexico border region must attempt to coordinate their response to natural disasters with their neighbors across the border, often through informal channels.

In addition, studies from the Center for Hazards and Risk Research at Columbia University have shown that natural disasters tend to have the greatest impact on the poorest people of a region. Collectively, U.S. border cities and counties constitute the poorest region of the United States, with many low-income and densely populated urban areas. Large numbers of U.S. border colonias residents live in substandard housing with inadequate infrastructure located in areas susceptible to flooding. Many neighboring Mexican border communities also have poor populations settled in precarious areas such as canyon bottoms and on steep slopes. Strapped municipal budgets and the lack of federal grant funding, with local populations growing at annual rates of 4 to 6 percent, result in the inability to maintain critical environmental infrastructure such as levees, storm drains, and sewage conveyance and treatment systems—infrastructure that is likely to be affected by natural disasters and capable of affecting neighboring communities on the U.S. side.

On a positive note, recent years have seen some improvement in the condition of environmental infrastructure on both sides of the border. Credit for this success belongs to numerous sources—local efforts, border state initiatives, and binational programs such as the Border 2012 program (*see following sections*) and the Border Environment Cooperation Commission/North American Development Bank. Yet despite this progress, the condition of environmental infrastructure in many border communities remains substandard for numerous reasons. Most important are declining state and federal support for infrastructure investment in conjunction with rapidly spreading urban areas and land use changes.

Scarcity of resources at the municipal level is only one facet of the problem. The link between poverty and added vulnerability is borne out on an individual household level as well. As noted above, in the U.S.-Mexico border region, low-income populations face particular challenges as they often live in risk-prone locations such as steep slopes subject to slippage or in river bottoms or flood plains subject to flooding. Their housing tends to be of lower quality construction and less resistant to damage from wind, earthquakes, and floods. Because many low-income residents do not have adequate insurance on their homes and possessions, they are reluctant to evacuate and avoid potential personal injury.

Moreover, post-9-11 concerns in the United States about border security have added an additional layer of complexity to many types of national policy decisions, including decisions that affect the border region's vulnerability to natural disasters. For example, maintaining a tightly controlled border for enhanced security may work against the need to cross the border quickly to provide timely assistance in the event of a natural disaster. Strong border controls can hinder cross-border communication and interaction with counterparts in Mexico that, in turn, may delay response to natural and other disasters.

On a government-to-government level, some institutional frameworks already are in place to begin to address the “natural disaster border barrier” prob-

lem. For example, the U.S. National Response Plan has a Support Annex on International Coordination that calls for working with the International Red Cross and Red Crescent Movement to assist family members in case of emergency (see *United States: Domestic/International Policies/Institutions section*). Moreover, during 2007, the Heads of State of the 3 countries issued a Joint Statement under the Security and Prosperity Partnership of North America that called for emergency management and preparedness along the borders between their nations to be a high priority (see *Spotlight on Promising Partnerships section*). In addition, at the conclusion of the XXV Border Governors Conference on September 27–28, 2007, the governors of the 10 U.S.-Mexico border states resolved to (1) develop a Five-Year Binational Emergency Response Strategic Plan that will include prevention, preparation, response, and recovery; and (2) develop a Memorandum of Understanding for mutual help in the event of emergencies among the 10 border states.

Although these codified frameworks of intent exist, they have yet to be implemented and therefore remain untested. Others, such as the 1980 U.S.-Mexico Agreement on Cooperation During Natural Disasters, have never been fully implemented and therefore have not always enabled the quick and targeted types of responses that are needed when a natural disaster strikes and impacts the same geographical region on both sides of the border. Some of these frameworks on paper are not set up to respond binationally to binational natural disasters. Often, their provisions were agreed on in earlier times when the border was lightly populated, before the existence of dynamic transborder metropolises with millions of residents.

Residents on both sides of the border are all too aware of the need to respond effectively in real time. Many of them have a great deal invested in ensuring that such is the case; U.S. and Mexican border twin cities (“sister cities”) have become increasingly intertwined. Substantial numbers of people live on one side of the border and work and shop on the other side. Many families, including tribal members, have relatives living on both sides of the boundary. In addition,

many maquiladoras in Mexican cities ship their finished products to the United States through the U.S. sister cities. Not surprisingly, under the circumstances, the onset of a natural disaster is likely to find many Americans on the Mexican side of the border and vice versa. Moreover, some of the critically needed resources for responding and protecting the public may be located on the other side of the border from where the disaster is occurring. Formal agreements between the U.S. and Mexican governments for responding to local transborder natural disasters have not evolved as rapidly as has the need for such mechanisms.

Given these sobering circumstances, U.S. border communities and their Mexican neighbors have begun to work together at the local level to prepare for natural disasters. One noteworthy result is the development of sister city emergency response plans. These plans, jointly developed by residents of neighboring border cities, set out specific procedures for working together in the event of chemical release and often entail training exercises to maximize preparedness. Despite their significant contribution to the problem, however, sister city emergency response plans have their limitations both in scope and resources. In many cases, they are designed specifically to address hazardous materials releases but not necessarily the broader issue of natural disasters (see *Binational Arrangements section*).

Complementing these sister city plans are a number of more informal, ad hoc arrangements. Having business associates, friends, and family on both sides of the border becomes a primary motivation for marshalling the resources to get the job done, regardless of where an individual or their agency may be based. Informal arrangements also have their limitations, however. Once the immediate threat is dealt with, attention turns back to other pressing matters. Assistance tends to be focused principally on issues of short-term recovery rather than on prevention for the medium and long range. More effective contributions will require a long-range preventive approach directed toward structural issues rather than only short-term remedial actions.

In summary, natural disasters continue to occur

along the border amid limited on-the-ground coordinated action from the United States and Mexico. The Good Neighbor Environmental Board has written this report to focus national attention on this gap in national policymaking and effective implementation. From its perspective, when formulating national policy on natural disasters and their environmental implications, it is essential that the specific circumstances and vulnerabilities found in the U.S.-Mexico border region be factored into the equation. Strategic planning, within this scenario, should include a keen awareness of conditions and institutional capabilities on both sides of the border. It also should include an in-depth understanding of whether well-intended U.S. national frameworks actually work—or do not work—in real-world circumstances.

It is in our national self-interest, as well as “good neighborly,” for federal policymakers to adopt this more strategic approach to managing natural disasters along our southern international border. By being prepared to effectively respond to natural disasters on both sides of the border, our homeland security will be strengthened. The Board encourages federal policymakers, both in the administration and Congress, to move forward with expedience to address vulnerabilities faced by the U.S.-Mexico border region in managing natural disasters.

Focus of This Report

The Good Neighbor Environmental Board defines natural disasters as discreet, extreme weather-related and other natural events that cause damage and require an immediate response. Moreover, because the Board is a federal advisory committee, its discussion of the issue primarily is limited to instances in which the federal government does, or should, get involved. In addition, because its mission is to provide advice on environmental and infrastructure issues along the U.S.-Mexico border, the Board primarily examined natural disasters in light of their effects on the environment and human health, as well as how the federal govern-

ment can most effectively apply its resources toward minimizing the negative effects.

The Board recognizes that natural disasters in the border region are especially complicated. For example, the U.S. federal government responds to two broad categories of incidents: domestic incidents/natural disasters and international incidents/natural disasters. Each category triggers a different set of responses, including whether or not the incidents are ultimately declared disasters by either the U.S. federal government or the Mexican federal government.

This report seeks to address the gap that may occur at a federal level in the border region when domestic agencies, which typically respond to one or the other of the above incidents, suddenly must look at both the domestic and international consequences/impacts of a natural disaster. Those agencies that normally only respond to a domestic disaster may suddenly be faced with international concerns as a result of an incident just across the border on the Mexican side. Likewise, U.S. federal agencies that normally provide international assistance to a foreign disaster may suddenly have to examine domestic implications of an event occurring on the Mexican side of the border. As such, the U.S.-Mexico border region provides a unique set of circumstances when compared to a domestic-only or international-only context.

Hurricanes, floods, tornadoes, wildfires, earthquakes, and mudslides are the specific disasters examined. The recommendations are formulated to provide both short-term and longer term measures. In addition, they cover steps that can be taken within the current policy arena as well as options involving possible changes—or at least reinterpretations—of existing policy.

Despite the decision to focus primarily on extreme weather events of short duration, the Board also decided that it would be remiss not to state its strongly held view that longer term trends such as desertification, severe drought, prolonged flooding, and climate change should be included in the natural disasters policy discussion. These slower acting cousins of catacly-



mic natural events justifiably can be viewed as natural disasters that occur over a longer timeframe. By viewing them as such, complacency, fatalism, and—most importantly—lack of preparedness can be avoided.

Also somewhat outside the scope of this report, but central to any policy discussions about natural disasters in *any* portion of the United States, is the need to carefully examine the link between human actions and natural disasters. For example, to what degree does construction of dams and levees encourage people to build in floodplains, potentially exacerbating damage from naturally-induced floods if/when the flood control structures fail? Might land-use practices be as responsible for flood and fire damage as the

water and fire itself? How do growing human populations in a region magnify the effect of natural disasters and increase human vulnerabilities? Could the impact of severe weather events be mitigated through better planning and urban development policies?

The report that follows addresses these human-factor issues to the extent that they affect environmental quality, in keeping with the Board’s mission, but not necessarily from a socio-economic perspective, which is outside its mission. These questions also require comprehensive answers if federal policies on managing natural disasters, whether they be in the U.S.-Mexican border region or elsewhere in the nation, are truly to be comprehensive.



The U.S.-Mexico border region spans four U.S. states, six Mexican states, and extensive tribal lands. Roughly two-thirds of the 1,952 mile border lies in Texas and is demarcated by the Rio Grande River. (Source: Harry Johnson, San Diego State University)



SECTION One

Effects of Natural Disasters on the U.S.-Mexico Border

Natural Disasters Effects on the Region's Environment

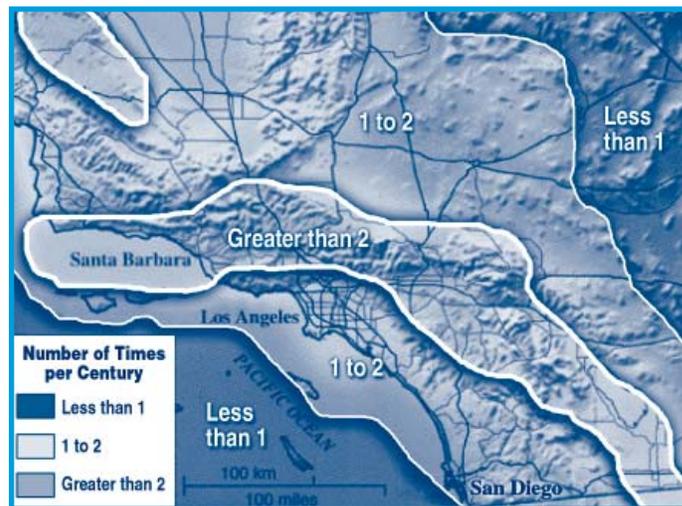
Hurricanes, floods, tornadoes, earthquakes, mudslides, and wildfires pose a risk to those living along the U.S.-Mexico border. Although floods, even in desert areas, may pose the most widespread threat, other disasters obviously can inflict just as much damage. Earthquake risk is especially strong in California as a result of the high tectonic activity, but earthquakes also have occurred in Texas. Texas is especially at risk for tornadoes, but tornadoes have struck other parts of the region as well. Wildfires can occur anywhere along the border.

On the Mexican side, less developed urban and flood control infrastructure and more settlement in flood prone areas and on steeper slopes make Mexican settlements more vulnerable to the effects of flooding, earthquakes, landslides, and tornadoes than their U.S. sister cities. The Mexican border populations, however, may be less at risk from wildfires because wildfires tend to burn naturally, without suppression, preventing the dangerous fuel load build up that occurs north of the border. In addition, there are more grazing activities and firewood removal activities near Mexican border settlements.

Recent history has all too clearly demonstrated the border region's continued vulnerability to natural disasters. In October 2007, for instance, wildfires raged through Southern California, destroying 2,000 homes and causing well over \$2 billion in damage. Although attention rightfully focused on the immediate toll on the communities that suffered, the ecological impact has yet to be assessed according to the nonprofit group, The Nature Conservancy.

Flooding also has continued to beset the region, with recent examples in Arizona/Sonora and Texas/

Chihuahua. In August 2007, intense local storms sent a wall of water through the Nogales Wash, an arroyo now lined as a concrete drainage channel that flows from Nogales, Sonora, through the heart of its sister city of Nogales, Arizona. The aging channel suffered extensive damage in the United States. A 116-foot long segment of the floor of the wash was swept away, and a massive void was detected behind the west wall of the channel. Perhaps of greatest concern was that the damage exposed an international sewer line that was underneath the floor of the wash, creating a significant risk that the sewer line would rupture, potentially flood-



Earthquakes continue to be a fact of life along the California-Baja California portion of the U.S.-Mexico border. Map shows number of times per century that bedrock shaking from earthquakes will be strong enough to cause damage in Southern California. Note that the focus is on bedrock and, therefore, underestimates likely damage from shaking in basins and valleys. (Source: U.S. Geological Survey Earthquake Hazards Program Web Site.)

ing parts of central Nogales, Arizona, with wastewater or contaminating the Santa Cruz River. Even as other storms approached, crews worked diligently to make emergency repairs. The governor signed an emergency declaration, authorizing use of National Guard troops if necessary. One year earlier, during the summer of 2006, severe flooding in the El Paso, Texas, and Ciudad Juárez, Mexico, area caused more than \$100 million in damage, resulting in El Paso being declared a federal disaster area.

Tornadoes also have made recent border region history. In April 2007, a pair of tornadoes struck Eagle Pass, Texas, and neighboring Piedras Negras, Coahuila. Along with widespread property damage, the toll on the population was seven people killed in Eagle Pass and three in Piedras Negras, with dozens injured in the sister cities. Tornadoes are infrequent in this part of the border; they are more common further east in Cameron County, which is the southernmost county in Texas. The county is bordered on its eastern edge by the Gulf of Mexico, making it more vulnerable to extreme weather events. During the past 55 years of data collection on tornadoes, no fatalities were recorded in Cameron County, but as the region continues to grow from a rural agricultural zone to a highly populated trade and manufacturing corridor, losses of both life and property are expected to escalate.

Following is a more detailed examination of how particular natural disasters continue to affect the region's environment.

Earthquakes, Landslides, and Mudslides

Earthquakes continue to be a fact of life along the California-Baja California portion of the U.S.-Mexico border. They can occur at any time, without warning. Besides the toll they exact on human life and property, earthquakes present significant environmental risks including destruction of infrastructure such as roads and bridges, pipelines, refineries, wastewater treatment plants, chemical storage facilities, dams, levees, and canals.

Earthquakes are a major cause of landslides, particularly when soils are saturated with moisture from intense rain events. Areas with steep slopes, such as

Slice of Border Region History: *Earthquakes in the Imperial Valley and Beyond*

The Imperial Valley is one of the most seismically active areas in California. There have been earthquakes of magnitude 6 or greater in 1915, 1940, 1979, and 1987. The strongest was a magnitude 6.7 quake in 1940 that killed 7 people. The geological forces that caused the November 23–24, 1987, earthquakes are the same ones that pulled Baja California away from Mexico to form the Gulf of California. Movement along the Imperial fault also caused damage to the irrigation system in the Imperial Valley. The All American Canal, which brings water from the Colorado River to the Imperial Valley, was damaged most severely. East of Calexico, the earthquake shook down levees on both sides of the canal. The banks settled more than 1 meter in places.

Earthquakes also have occurred in other parts of the border region. In 1995, for instance, a magnitude 5.3 earthquake struck the Alpine-Marathon area of southwest Texas. The largest earthquake in history to strike this region occurred in 1931 near Valentine, Texas, and had a magnitude of 6.4.

the San Diego-Tijuana region, are especially susceptible to mudslides during earthquakes and after wildfires when vegetated slopes have become barren and are vulnerable to the effects of storms. Once a mudslide or landslide occurs, recovery and rebuilding activities may be limited because of lack of insurance coverage; insurance companies consider these disasters “land movement” events and, therefore, mudslides are not covered under base property insurance policies. Whereas significant sums of insurance payments may be available after a major fire or hurricane, mudslides, like earthquakes, will not trigger payments unless the individual property owner chooses to purchase supplemental coverage. The ripple effect of this lack of cover-

age is that resulting environmental concerns such as water pollution, chemical spills, and the presence of other environmental problems may not be addressed adequately because of lack of funds.

Wildfires

Wildfires are caused by lightening strikes or by people, either accidentally or intentionally. Wildfire performs important ecological functions that border

region habitats have adapted to for millennia. Some of the indigenous people of the region used fire as a land management tool, as did later Mexican and Anglo ranchers. Fire suppression has become a regular practice during the past century as fuels in the form of grasses, shrubs, and trees have built up to dangerous levels. In recent years along the U.S. side of the border, ranches in grasslands, shrublands, and forests have been subdivided into “ranchettes,” increasing the rural population and hence the demand for fire sup-

Slice of Border Region History: 2003 Cedar Wildfire, San Diego

One of the largest fires in Southern California history, which started on October 25, 2003, burned a total of 280,278 acres during the course of 22 days. The cause was a local deer hunter setting fire to brush and timber to signal his whereabouts after being separated from his hunting partner. Because of the dry conditions of surrounding vegetation—mostly chaparral—in combination with Santa Ana winds, the Cedar fire spread extremely rapidly.

In an effort to contain the fire, the California Department of Forestry and Fire Protection, U.S. Department of Agriculture Forest Service, local governments in Southern California, tribal fire departments, and a number of volunteer agencies provided support. Mexican participants in the Border Agency Fire Council (see *Spotlight on Promising Partnerships* section) crossed the border to help. The Federal Emergency Management Agency (FEMA) also provided funding to cover 75 percent of the total cost as a result of President Bush’s approval of the Fire Management Assistance Grant Program and declaration of a federal disaster in response to then-Governor Gray Davis’s request for assistance.

In addition to the incineration of forests, the environmental consequences were dramatic. Storm water runoff, normally absorbed by well-vegetated soils, increased by approximately 12,675,000 cubic feet as a result of the loss of vegetation. A study done by the nonprofit group American Forests estimates a \$25,350,000 cost to retain the additional runoff to protect current infrastructure. Traces of ash in run-off water also resulted. San Diego County spent approximately \$6.5 million in toxic and hazardous debris removal in preparation for the following rainy season in an effort to reduce contamination of nearby water sources.

Within the Cedar Fire area in the San Diego City boundaries, 49 percent of the tree canopy, which removes approximately 315,000 pounds of air pollutants per year, was eliminated. American Forests estimates the annual loss in value at roughly \$800,000.

The fire also exacted a toll on human life and health. Fifteen civilian fatalities were reported, two of which were a firefighter and an unidentified male who was believed to be a transient. Out of the 1,478 total fire personnel, 104 firefighters were injured.

As is the case for many wildfires, the ecosystem effects of the Cedar Fire were complex. A subspecies of native coastal rainbow trout with a highly restricted range was completely eliminated in the wild. Fortunately, a group of 16 fish had recently been placed in an aquarium at the Chula Vista Nature Center prior to the fire. Three additional species listed under the Federal Endangered Species Act had their habitat affected but not completely destroyed: the Least Bell’s Vireo, the Coastal California gnatcatcher, and the Quino checkerspot butterfly. The gnatcatcher depends on a type of low brush that responds well to fire and regenerates completely within about 2 to 3 years of burning. Fire plays an important role in providing diversity to certain vegetative communities. The patches of grass and shrub that re-grow in the wake of a forest fire provide sources of food and cover to species that are not well adapted to forests. The Cedar Fire was clearly a tremendous disaster for those whose homes lay in its wake. The cycle of fire, regeneration, and re-growth is a perilous reality for communities established in the forests and chaparral in Southern California.

pression to protect property. The people living in these isolated residences on both private and tribal lands increase political pressure to suppress all wildfires. When the high levels of fuels are finally ignited, whether by lightning strike or human activity, the results can be catastrophic.

A unique feature of wildfire causation along the border is the increase in illegal activities. Land managers in the Cleveland National Forest in Southern California have noted a direct link between wildfires and the presence of undocumented migrants and drug smugglers. As illegal activities increase, law enforcement activities also increase. The main cause of wildfires is illegal campfires, but discarded lighted cigarettes and sparks from machinery and vehicles also cause wildfires. Some also suggest that smugglers have set fires intentionally to avoid capture, and that others have started fires to eliminate dense vegetation that serves as hiding areas for migrants and smuggling activities.

Whereas many of the ecosystems of the borderlands are adapted to fire as a natural part of regeneration and re-growth, fire reduces available resources for a period of time and sometimes can destroy cultural resources. Forests will re-grow, but immediately after fires, timber and forage are eliminated. Wildlife habitats shift, scenic vistas are altered, and watershed functions for human benefit are compromised. During and immediately after the fire, hazardous materials and pollutants are released into the air, water, and soil. In addition, smoke and other emissions contain pollutants that can cause significant health problems, especially for vulnerable populations such as children, the elderly, and asthmatics.

Secondary and potentially long-term effects of wildfires often are more disastrous than the fire itself. These secondary effects include increased potential for flooding, debris flows, and landslides; increased erosion; introduction of invasive species; changes in water quality; and reduced access to recreational areas.

Tornadoes, Hurricanes, and Floods

Tornadoes are unwelcome visitors to the border region, particularly in the Texas-Mexico borderlands at the southernmost edge of what is known as “tornado alley.” They are caused by the collision of cool and

warm air masses and can trigger significant environmental impacts, particularly when they strike a facility that contains potentially hazardous or toxic materials. As is the case of other natural disasters, post-tornado cleanup of debris and other wastes is a labor-intensive process including segregation of wastes for appropriate disposal to either a municipal landfill or an industrial or hazardous waste facility.

Although much of the U.S.-Mexico border region is desert, paradoxically, the region also experiences periodic devastating hurricanes and floods. Hurricanes not only bring wind damage but also devastating coastal storm surges, heavy inland rainfall, and tornadoes. For instance, the states of Texas and its Mexican neighbor, Tamaulipas—with approximately 800 miles of coastline on the Gulf of Mexico—particularly are vulnerable. In fact, during the 20th century, Cameron County, Texas, located on the Gulf of Mexico at the U.S.-Mexico border, experienced seven hurricanes, including five direct hits. Besides Texas, portions of California, Arizona, and New Mexico also have been affected by hurricanes.

Flooding, perhaps paradoxically, remains one of the border region’s most widespread natural disaster threats. The Rio Grande, which forms the U.S.-Mexico border for 1,254 miles, has historically experienced cycles both of drought and devastating flooding. Although overall rainfall in the region is relatively low compared to other parts of the United States, the rain often comes in brief but intense weather events, making flash floods common in the desert. In the coastal Mediterranean climate of California and Baja California, the only area of North America to possess such a climate, much of the yearly precipitation comes in a few intense winter storm events, which usually produces high runoff and flooding.

As mentioned earlier, El Paso, Texas; Ciudad Juárez, Chihuahua; and Doña Ana County, New Mexico, remain at risk for floods more than 1 year after intense local storms caused widespread urban flooding in August 2006. Although some work has been conducted to repair inadequate dikes and drainage structures, much work remains, especially in Ciudad Juárez, where inadequate dikes put nearby residents at risk.

Besides the property destruction and health problems associated with many types of natural disasters, floods also can contaminate the water supply, overrun

Slice of Border Region History: *Ballad of the 1930 Nogales Flood*

Border residents have long recorded significant local events through corridos (folk ballads). Torrential rains and a flood on the afternoon of August 7, 1930, struck Ambos Nogales (neighboring U.S. and Mexican towns, both called Nogales). Seven people died and 100 homes were destroyed in Nogales, Sonora; the U.S. city saw eight people killed and 3,000 left homeless. The event was chronicled in a *corrido* by G. Guzmán, "Inundación de Nogales" (The Nogales Flood), recorded in January 1931. Written from the perspective of Nogales, Sonora, the *corrido* spoke of the destruction and the response of the authorities, including assistance from the U.S. side:

A mil y novecientos treinta
pongan muy bien su atención
pues en Nogales, Sonora,
había una inundación.

A la una de la tarde
un jueves tengo presente,
azotó una tempestad
donde murió mucha gente.

...

A las cuatro de la tarde
pues vuelve la tempestad,
se prolongó por tres horas
destruyendo la ciudad.

...

Para no cantar a ustedes
les ha de dar compassion,
de ver la gente en la calle
corriendo sin dirección.

Hasta hoteles y tiendas
Muchas estaban destruidas,
y también muchas personas
allí perdieron sus vidas.

...

Ayudó la Legión de Honor,
la Cruz Roja Americana,
que fueron a dar auxilio
a la ciudad Mexicana.

In nineteen hundred and thirty
now pay very close attention,
Well, in Nogales, Sonora,
there was a flood.

At one in the afternoon
it was a Thursday,
A tempest lashed the place
where many people died.

...

At four in the afternoon
well, the tempest returned,
It continued for three hours
destroying the city.

...

So as not to sing to you
I want to offer my compassion,
To see the people in the streets
running around in confusion.

Even hotels and stores
many were destroyed,
And also many people
there they lost their lives.

...

The Legion of Honor helped
as did the American Red Cross,
They went to give aid
to the Mexican city.

Source: *Corridos & Tragedias de la Frontera, Mexican-American Border Music, Vol. 6 & 7, Arhoolie Folklyric 719/720, 1994.*

wastewater treatment plants, and inundate urban environmental infrastructure and farmland. Contaminated floodwaters can contribute to health risks such as bacterial contamination, and mosquitoes breeding

in stagnant floodwaters can become carriers of various types of illnesses (*see Effects on the Region's Human Health section*). Wind and flooding also can devastate habitat important for native species.

Flood Damage Vulnerabilities

Like wildfire, flooding is a natural occurrence that can cause significant damage to human life and property, particularly when exacerbated by additional factors such as urbanization.

Population growth. Flooding in the border region often is particularly devastating because of development patterns. Rapid population growth, especially in Mexican communities, often has outpaced government's ability to provide services such as roads, drainage systems, and wastewater infrastructure. Moreover, encroachment of population and transportation routes onto the floodplains and drainage areas greatly exacerbates flood problems. When people reside or conduct other activities in the floodplain, and when they use natural drainages for roads (drainages that are dry most of the time), the consequences can be devastating during storms. For instance, in Ciudad Juárez, Chihuahua, following floods in 2006, government officials offered to relocate residents who built their homes in high-risk floodplains. Although many have moved, some refuse to relocate, choosing to remain in high-risk zones.

Problematic wastewater infrastructure design. In some border communities, wastewater infrastructure consists of collection systems located in low lying areas that move waste by gravity, a scenario that makes these communities particularly susceptible to damage from flooding. One such community is Nogales, Sonora; according to a Border 2012 study (see *Binational Arrangements* section), wastewater pipes in this community often are co-located with drainage channels. When the channels fill up with torrents of stormwater, pipe joints dislodge and the pipes fill with sand, causing even more ruptures farther downstream. In this way, flood events trigger sewage spills. The sediment also can impact operation and maintenance of wastewater treatment plants.

To address these problems, the Border 2012 Arizona-Sonora Water Task Force recommends funding to plan a program of both structural and nonstructural flood control management. Structural features would include filtering systems, ponds, and rainwater harvesting (in other regions, they often consist of levees,

floodwalls, and dams), whereas nonstructural management would address land use planning, land conservation, and stewardship programs. The rationale is that by directing development away from flood-prone areas, communities can spare the expense of costly structural cures.

Inadequate flood control infrastructure. Another problem to contend with is the lack of municipal and federal resources for maintaining flood control infrastructure. In many border cities, stormwater control systems are not in place or are poorly developed. This scenario is particularly evident in Mexican border cities, where: (1) unplanned or poorly planned urban expansion, and (2) budgets stretched to the limit to provide water and wastewater services make such investment difficult and not always the highest priority. In other border communities, infrastructure such as levees is in great need of repair. This problem came sharply into focus during 2007 as work continued under the U.S. Department of Homeland Security's FEMA Flood Map Modernization program. This program was established to improve and update the nation's flood hazard identification maps. These flood maps are used to identify and depict flood hazard areas and set flood insurance rates in communities. They also support local planning, emergency preparedness and response, and natural resource management (see www.fema.gov/plan/prevent/fhm/mm_main.shtm).



During the summer of 2006, severe flooding in the El Paso, Texas, and Ciudad Juarez, Mexico, area caused more than \$100 million in damage, resulting in El Paso being declared a federal disaster area. (Source: Federal Emergency Management Agency)

FEMA currently is preparing updated Digital Flood Insurance Rate Maps for targeted counties across the United States, including several in the U.S.-Mexico border region. As part of this process, FEMA has requested that entities operating and maintaining flood control systems certify that those systems provide adequate protection against a 1 percent annual chance flood event—that is, the flood that has a 1 percent chance of occurring in any given year (often referred to as the 100-year flood). In several cases, after assessing the flood control infrastructure, these entities have reported back to FEMA that they are unable to certify that the systems in question are adequate.

Local officials and property owners in these communities have raised concerns about the implications of flood hazard areas identified in their communities. They cite concern over requirements for property owners to purchase flood insurance and apprehension that such a designation will make their communities less attractive to outside businesses and inhibit economic growth.

Some communities have begun to take steps to address their concerns. For instance, the Doña Ana County Commission in New Mexico passed a resolution urging delay of the flood mapping process in the county until certain concerns and questions could be answered. The county and other entities have raised questions about the accuracy of FEMA's flood model and draft maps. Regardless of the methodology used to model risk, work needs to be done to restore the integrity of flood control projects along the border. Entities such as the U.S. Section of the International Boundary and Water Commission (USIBWC) and the Hidalgo County (Texas) Drainage District #1 are working to raise and rehabilitate deficient Rio Grande levee segments to meet the FEMA certification requirements. Properties near levees that are repaired and certified before the FEMA maps are finalized are expected to be removed from the flood hazard areas on the maps and be exempt from mandatory purchase of flood insurance.

Housing, zoning. As noted previously in the introduction, low-income housing often is constructed of substandard materials. Moreover, it frequently is located in arroyos (natural run-off corridors or intermittent creeks) or other low lying and vulnerable areas,

placing many at risk. For a variety of reasons, however, local governments often are reluctant to require residents to relocate. In addition to these issues related to low-income housing, permits have been issued in some communities to construct middle class subdivisions in arroyos. This issue has been brought to the forefront in El Paso, Texas, with neighborhood activists opposing the concept. It should be noted that floodplain construction may be acceptable in some cases, as long as the residents take certain steps such as elevating their homes and purchasing flood insurance.

Mexican border cities such as Tijuana and Piedras Negras encounter great difficulties in protecting river floodplains, arroyos, and vulnerable slopes from encroachment by formal and informal settlements. Zoning is weak, and enforcement for zoning tends to be even weaker. Conflicting layers of governmental management make some actions difficult or impossible. For example, a federal agency, the National Water Commission (*Comisión Nacional del Agua*, CNA) owns the river channel and flood plain in the Alamar-Tijuana River system, but does not prevent unauthorized use of that area. The Municipality of Tijuana, which would like to prevent squatter settlements in those areas, lacks the legal authority to do so. The result is that people establish informal settlements in the river flood plain and arroyo bottoms, which are affected by the most severe of the winter storms, often with loss of life and considerable property damage.



Next Steps To Address Flooding Vulnerabilities

Allow time for levee improvements completion before Digital Flood Insurance Rate Maps are finalized. Construction of flood control improvements already is underway in some parts of New Mexico and Texas. The Federal Emergency Management Agency (FEMA) should wait until these projects are completed before Digital Flood Insurance Rate Maps are finalized.

Support development and use of more sophisticated modeling to more accurately map flood risk. FEMA and the affected entities should be given flexibility in meeting modeling and mapping deadlines to provide the most accurate maps possible.

Slice of Border Region History: *Hurricanes with Cross-Border Effects*

One storm can affect numerous communities in both the United States and Mexico, even communities far from the border region. For example, Hurricane Gilbert made history in 1988. After pounding Jamaica and the Yucatán Peninsula, Gilbert made landfall for the final time as a Category 3 hurricane with winds of 125 miles per hour near La Pesca, Tamaulipas, about 150 miles south of Brownsville, Texas. Its worst damage was some 175 miles inland in Monterrey, Nuevo León, where Gilbert brought torrential rainfall and flooding, killing 150 people. The storm then turned to the north, spawning tornadoes in San Antonio and Del Rio, Texas, killing two people.

The hurricane of legend in the region was Beulah, in 1967. A Category 3 storm by landfall, it roared ashore on September 20 at Brownsville with 136 mile-per-hour winds. As it proceeded inland, it dumped up to 35 inches of rain in the Rio Grande watershed—an area already saturated from rains the previous month. The resulting flooding caused serious damage in Harlingen, Texas, and at the airport in McAllen, Texas. More than 20,000 acres of agricultural lands were flooded. Urban and agricultural damage also was severe in Mexico. According to the National Weather Service, every river or stream in south Texas to the south of San Antonio flooded. The storm also triggered a record 95 tornadoes in Texas, including a deadly tornado 250 miles away at Palacios that killed four.



Hurricane Beulah came ashore on September 20, 1967, at Brownsville, Texas, with 136 mile-per-hour winds. As it proceeded inland, it dumped up to 35 inches of rain in the Rio Grande watershed. The storm also triggered a record 95 tornadoes in Texas. Shown, under water, is Harlingen, Texas, with the Arroyo Colorado in the middle of the photo. (Source: County of Hidalgo, Texas)

Encourage local, state, federal, and binational cooperation on flood control issues. Flood control projects often touch on many jurisdictions and agencies on both sides of the border. For example, certification of Rio Grande levees in El Paso County, Texas, requires cooperation of the U.S. Section of the International Boundary and Water Commission (USIBWC; a federal agency), the City of El Paso, and a local irrigation district. Whereas the USIBWC maintains the Rio Grande flood control levees, the other entities have drainage structures that enter the river through the levees. To meet FEMA certification criteria, these entities must have agreements in place for coordinated operations of these structures in the event of a flood.

Support technical cooperation and financial assistance to Mexico for needed flood control improvements. The magnitude of flood that the levee system in the international reach of the Rio Grande is designed to handle is determined internationally so that both the United States and Mexico share equally in the risks and benefits of flood control projects. As the United States moves forward with plans to restore degraded levee segments to their original design, appropriate data and model sharing needs to take place with Mexico.

Develop common approaches to urban watershed management in sister cities. The U.S. federal

Slice of Border Region History: *Noteworthy Floods and Storms*

Colorado River, 1905—Temporary diversion of the Colorado River, constructed to replace water from the blocked Imperial canal, was breached by floodwaters. The Colorado River changed course and flowed into Salton Sink (the site of the ancient Lake Cahuilla), creating the modern Salton Sea.

Colorado River, 1909—25.3 million acre-feet passed through Laguna Dam, located near the U.S.-Mexico border upstream of Yuma, Arizona. This was enough water to fill 94 percent of present-day Lake Powell.

Tijuana River, 1916—Major storm caused significant flooding in the Tijuana River and adjacent areas in northern Baja California and Southern California. Houses, farms, dams, and transportation were destroyed, and there was some loss of life.

Rio Grande, 1932—The flood originated in the Pecos and Devils Rivers in the United States, with flow peaking at 350,000 cubic feet per second at Laredo. The storm led to a U.S.-Mexico agreement for a coordinated flood control plan.

Rio Grande, 1954—Biggest flood since 1865 and second biggest since 1746, the flood occurred during the Texas drought of record, with flows reaching 1 million cubic feet per second at Del Rio, Texas, and Ciudad Acuña, Coahuila, and filling Falcon Dam, built just the year before, preventing untold damage downstream.

Rio Grande, 1967—Hurricane Beulah led to significant Rio Grande flooding, killed 58 people, and caused more than \$1 billion in damage to Harlingen and McAllen in Texas and Ciudad Mier and Camargo in Tamaulipas.

Southern California, Northern Baja California, and Southwestern Arizona, 1976—Hurricane Kathleen, an eastern Pacific cyclone, brought torrential rains and high winds to northern Baja California, Southern California, and the desert areas around Yuma. The track of the railroad that connected Tijuana with the Imperial Valley was washed out in several locations, and there was loss of life in the Yuma, Arizona, region. Farmland in the Imperial Valley was flooded, and the level of the Salton Sea was raised.

Río Escondido, 2004—Normally a dry streambed, this river, located in Piedras Negras, Coahuila, across the border from Eagle Pass, Texas, experienced a devastating flash flood, killing dozens and damaging hundreds of homes. According to reports, the river rose 25 feet in just 15 minutes.

El Paso, Texas; Ciudad Juárez, Chihuahua; and Doña Ana County, New Mexico, 2006—Intense local rainfall caused widespread urban flooding as local stormwater systems were overwhelmed. A stormwater detention basin in Ciudad Juárez was at risk of collapse, with the potential to flood downtown El Paso, forcing the evacuation of 1,500 residents of downtown and south El Paso. To prevent a recurrence of this dangerous situation, the stormwater detention basin has since been decommissioned.

government should work with Mexican counterpart entities, as well as with binational agencies, to provide leadership and technical and financial support for local communities to develop common approaches to land use, zoning, building codes, and flood control structures in vulnerable areas of the sister cities. (This concept is the urban component of binational watershed

management that the Board has recommended in a number of its previous reports.)

Provide outreach and education to residents living in floodplains. The FEMA Texas office and the National Flood Insurance Program of the State of Texas visited local border counties in Texas in spring/

summer 2007, informing residents who lived in floodplains of their options, such as elevating houses and purchasing flood insurance. This type of collaborative outreach should continue.

Use provisions within the Clean Water Act to create Watershed Restoration Action Strategies. Section 319(h) of the Clean Water Act allows for a stakeholder-driven process to assess watershed function. In the mostly semi-arid environments of the U.S.-Mexico border, flooding can be ameliorated by implementing best management practices throughout

watersheds. Although the connections between clean water and flooding may not be obvious on the surface, when the watershed as a whole is examined, cumulative impacts can be teased out into component parts. Housing construction in arroyos, installation of pavement, excessive livestock grazing in headwaters, or agricultural practices not only alter water quality but also increase storm runoff as well. A holistic examination of the issues in a watershed should be undertaken by border communities.



Natural Disasters

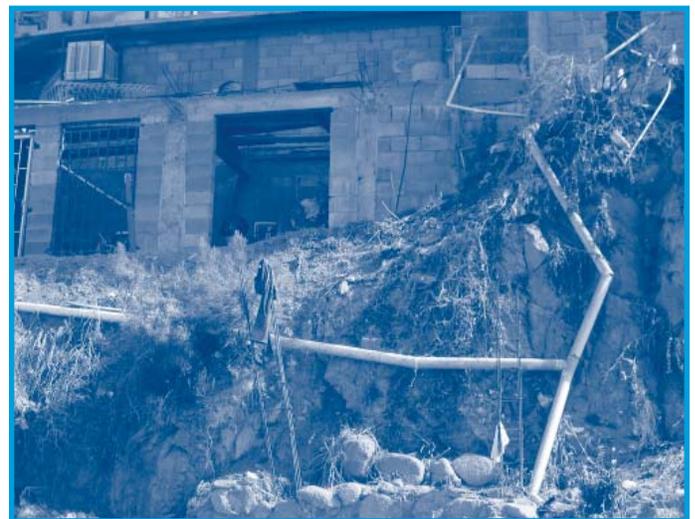
Effects on the Region's Human Health

Primary health effects from natural disasters include injuries and death from wind-borne objects, structural failures, floods and flash floods, and wildfires. There are numerous secondary effects as well. Natural disasters may lead to industrial accidents, including hazardous materials spills. They also can cause disruptions in food and water supply and sanitation systems, leading to waterborne infectious diseases. In addition, they may lead to large-scale population displacement and great psychological stress.

Flooding and earthquakes disrupt transportation infrastructure, delaying response by public health authorities and evacuation of healthy and disabled residents. Earthquakes may cause buildings to collapse, producing dust and other air pollutants. As noted previously in this section, wildfires also worsen air quality, exacerbating illnesses such as asthma. In fact, the entire public health infrastructure may become completely overwhelmed, including destruction of facilities and shortages of staff.

As mentioned earlier in this report, hurricanes and floods damage drinking water and sewage treatment plants, thus affecting human health via waterborne pathogens that can cause diseases such as typhoid fever, cholera, leptospirosis, and hepatitis A. If electricity is lost for a period of time, the level of chlorine in drinking water distribution systems decreases, and pressure drops in the system can permit infiltration of contaminants, requiring residents either to boil

drinking water or purify it in another manner. Flooding can produce pools of stagnant water that provide breeding areas for mosquitoes, which may transmit diseases. Landfills may be damaged, polluting ground and surface water and scattering solid waste, which can increase populations of disease-bearing rodents. Vector-borne diseases, those carried by either insects or animals, may include malaria, dengue and dengue



Domestic wastewater hookups like this one along Nogales Wash in Nogales, Sonora (across the border from Nogales, Arizona) are especially vulnerable to high-flow events during the summer monsoon season. Damage to these hookups from floods may result in discharges of untreated sewage into binational waterways. (Source: Arizona Department of Environmental Quality)

haemorrhagic fever, yellow fever, and West Nile virus. Dengue, for example, usually appears 4 to 12 weeks after a storm as a result of the time needed for reproduction of mosquitos and the availability of a human carrier to be bitten to transfer the infection. These diseases all are present in areas along the border, and al-

Promotoras – Key Members of the Health Worker Disaster Response Team

“Promotoras”—sometimes called “promotores” to indicate both male and female workers—are well-known and trusted members of the U.S.-Mexico border community health team. They receive their training from health care professionals and take on the key role of talking with families in their homes about health issues and disease-prevention methods (see *the Board’s Seventh Report, “Children’s Environmental Health”*). Examples of sister city pairs along the border where the promotoras approach is being used include Yuma/San Luis-San Luis Rio Colorado, Ambos Nogales, and El Paso-Ciudad Juárez.

For many border communities, promotoras are a critical component of the community health worker team, especially those communities where Spanish frequently is the first language of a family. In fact, the promotoras tradition is ingrained in Mexico’s border communities and increasingly is viewed as an extremely effective tool in the United States as well. Because of their local credibility, promotoras are able to deliver culturally sensitive education to families as well as collect data on families’ health status. They also offer the potential to be key players in responding to human health needs related to natural disasters.

In Arizona, for instance, promotoras are being trained on emergency preparedness and response techniques and linked to the local emergency preparedness agencies (city, county, and state). Promotoras organizations there are working with the Red Cross, the Arizona Citizen Volunteer Corps, and local firefighters groups. They are required to be certified in CPR and to take a first aid course.

In New Mexico, the New Mexico Department of Health worked with the U.S. Department of Housing and Urban Development (HUD) to assist the colonia of Del Cerro and the City of Hatch to educate colonias residents on how to address mold and mosquito control. Flyers were printed in English and Spanish, and the local community centers served as the distribution centers.

On a national level, emergency preparedness continues to feature as a topic in the promotoras’ annual national conference.

though they currently do not constitute a significant health threat, they do require ongoing monitoring. In addition, they could become a major concern in the wake of a major natural disaster in the border region.

Natural disasters especially affect those border region residents who live in poverty with its attendant health, housing, and urban infrastructure issues. Many of these residents are located in and around the region’s urban centers and depend on large municipal environmental infrastructure systems such as drinking water filtration plants and wastewater treatment facilities. These facilities, however, may be poorly designed and maintained and therefore especially vulnerable to extensive damage from natural disasters. In addition, many of the region’s poorest residents on both sides of the border live in unincorporated settlements not connected to municipal infrastructure (see *Colonias section*). Instead, they may rely on outdoor privies and drinking water stored in barrels or drawn from shallow and contaminated wells, circumstances that also create particular types of vulnerability to natural disasters.

All U.S.-Mexico border-region residents face an additional health challenge: the inability to quickly and effectively move medical assistance across the international boundary. As a result, the nearest source of aid in a natural disaster crisis may well be literally unavailable. For example, although the U.S. Department of Health and Human Services has created a National Disaster Medical System comprised of 6,000 volunteers, only some of these volunteers have passports and could not be deployed internationally without waivers. Also, certification standards for health care professionals vary across borders.



Next Steps To Address Health Effects of Natural Disasters

Include cross-border evacuations in preparedness planning. Preparedness plans need to consider elderly residents for evacuation, special needs shelters, and medical needs. Besides evacuating the critically ill and elderly, plans should recognize that those with chronic conditions such as asthma also may need to evacuate. Emergency response exercises should be undertaken on a regular basis. In addition, planning for evacuations across the border should be carried out because, at any one time, thousands of U.S. border city

residents are visiting across the border and vice versa. Texas officials made such preparations for Hurricane Dean in August 2007, although Dean eventually missed Texas completely. Finally, to help the public do its part in preparedness, make information widely available in both English and Spanish. For example, the Southern California Earthquake Center developed a bilingual earthquake preparedness handbook and distributed millions of copies through newspapers, the American Red Cross, and home improvement stores.

Incorporate lessons learned for post-impact injury prevention. Lessons learned from Hurricane Katrina include creating widespread safety messages in both Spanish and English on safe placement and use of generators and warning of the risk of downed power lines. Other lessons include the following: restore electrical service as a priority and provide advice on safe motor vehicle use during and after a storm. These outreach campaigns need to be devised by U.S. and Mexican authorities and designed for dissemination in the binational footprint of the likely disaster.

Strengthen post-impact associated disease prevention. To reduce communicable disease risks from natural disasters, work to restore service from affected wastewater treatment plants. In addition, make uninterrupted provision of safe drinking water a top priority. Note that not only flooding can affect drinking water supplies—in the 2007 Southern California wildfires, one community, Ramona, was without water for several weeks, and residents had to resort to trucking in water and boiling existing supplies. These plans need to be developed in a coordinated way for both sides of the border.

Strategically harness technology to aid in post-disaster recovery. For example, starting in 2008, the State of Texas will use Radio Frequency Identification wristbands to identify and track natural disaster evacuees.



Natural Disasters

Effects on the Region's Wildlife and Ecosystems

Natural disasters are deemed as such by people, but they always have played a role in the structure and function of native habitats. For instance, barrier islands off the coast of Texas lessen the impacts of hurricanes while providing breeding habitat for seabirds. Hurricanes landing on the Texas Gulf Coast have uprooted sabal palm forests, but these disturbances result in a more varied natural community that, in the long term, is more diverse and resistant.

Tornadoes touching down in southern Texas have left swaths of thorn scrub barren for miles, but regrowth of low growing grasses in the wake of tornadoes benefits white-tailed deer and rodents that are prey for species such as the endangered ocelot. Although mudslides in California have buried streams, they also have provided a new substrate for plants. Flooding has scoured the banks of the Rio Grande and the Colorado River and deposited large amounts of sediments downstream, burying aquatic and riparian

habitats, but it is the sediments that provide soil for a new generation of floodplain forests. Hailstorms have killed quail and other small vertebrates, but provide much needed moisture. Wildfires have converted old growth forests into grasslands or shrub lands, killing many plants and animals in the process while benefiting a new suite of species.

These intense disturbances of the status quo have disrupted breeding cycles, entire ecosystems, and altered the way watersheds behave. In an increasingly urbanized border, these changes disrupt the ecological services on which humans have come to depend. It can be difficult and costly for large urban communities to adapt to altered watershed function.

In today's border environment, natural disasters threaten wildlife and ecosystems mainly when their habitats already have been significantly altered by human activities. Mudslides provide a case in point. In Southern California along the border, the cycle of

drought, fire, rain, and sediment movement has been in place for thousands of years. Normally, vegetated slopes act like a sponge, soaking in water after rains. In areas where fire suppression has been aggressively practiced in recent times, however, areas may not have burned in decades. Under these conditions, heavy rains following wildfires often erode the post-wildfire barren slopes and erode large amounts of soil and material, destroying vegetation in the process. The cycle itself is natural, but it is the scale and periodicity of the cycle that has changed. With the continued increase in the number and scale of mudslides, some aquatic species that have become confined to drainages within this altered cycle are at risk of extinction. Wild southern steelhead trout in the streams of San Diego County are particularly at risk, as well as wild rainbow trout populations in the headwaters of these streams.

The California-Baja California border area has an extremely high degree of seismic activity, which can temporarily or permanently alter the intricate natural plumbing system. Earthquakes can alter the direction of rivers and streams as well as drain current spring sites or create new ones. In fact, the greatest threats to wildlife and ecosystems are the changes in hydrology that, in turn, can affect springs that are home to species such as the endangered Devil's Hole pupfish, found now in just one spring in Southern Nevada, north of the border region. Flash flooding has been deemed a significant threat to this fish as well.

The impacts of flooding merit specific attention in a review of impacts to wildlife and ecosystems. The two most significant river basins of the border, the Rio Grande and the Colorado, are lined by floodplains adapted to flooding. Both river systems are primarily snow fed (for the Rio Grande this is true primarily upstream of El Paso) and both surge in spring, before dams and diversions, during the annual snowmelt. Species such as cottonwood, willow, and minnows all are highly adapted to these annual flooding events, which serve as environmental cues for reproduction. Cottonwood and willow seed require moist soils for establishment, and some minnows require receding waters in floodplains for spawning. Pulses of water also move sediment that accumulates at the mouth of arroyos and move it downstream to become the seedbed of new forests, and eventually sandbars at the mouth of the river, protecting the coastline from hurricanes.

To humans, the impacts of flooding often are devastating. Without flooding, however, the ecosystems of the Rio Grande and Colorado Basins will become extinct. This complex paradox is one of the greatest challenges of balancing environmental and human needs along the border.

Wildlife and Ecosystem Vulnerabilities

Human changes to the landscape have significantly altered natural systems in the border region. Dams and levee systems, along with irrigated farming and urbanization, have changed the natural regime of rivers of the arid border, transforming stream flows, riparian ecosystems, regional biodiversity, and groundwater. These cumulative changes have made wildlife and ecosystems of the border more vulnerable to the effects of natural hazards.

Human Alterations of Surface Water Flow.

One of the most significant differences in the impact natural disasters have on wildlife and ecosystems now, as opposed to former times, is the human factor. For example, the natural flooding cycle has been inter-



The masked bobwhite quail (shown) is one example of a species facing significant habitat loss in the borderlands. State- and federal-sponsored programs for prescribed fire may help reduce incidents of large wildfires, as well as help maintain these species' habitats. (Source: Buenos Aires National Wildlife Refuge)

rupted by construction of dams and levee systems. According to a 2000 report by the World Wildlife Fund, “The conversion of natural habitats to agriculture and urban areas, the introduction of exotic species, water diversions, flow regulation, dam and levee construction, channel straightening and dredging, and numerous other changes have taken place along the desert Rio Grande and all have impacted the organisms of the riparian landscape immensely. The dynamics of the river system and the ecosystems that depend on it have been changed, reducing the natural heterogeneity of the system and severing connections between the patches within it.”

Urbanization, Security, and Fire Suppression. Urbanization, transportation infrastructure, and security related activities also are impacting natural systems of the border region. The spread of these activities into formerly undisturbed, or lightly disturbed, areas has resulted in fragmentation of ecosystems. This occurrence has reduced the size of the patches of habitat, so that in some areas the remaining ecosystem fragments are too small to support some species such as the endangered ocelot and jaguarondi along the border of Texas and Tamaulipas. In addition, active fire suppression has accompanied urbanization into natural areas so as to protect homes and structures. As stated in this section, this practice has led to a dramatic increase in the fuel load, which has resulted in larger and more intense wildfires. These super wildfires have the potential to affect very large areas and even extirpate species.



Next Steps To Address Wildlife and Ecosystem Vulnerabilities

Institutionalize a watershed approach to managing wildlife and other resources. As mentioned previously, the Clean Water Act Section 319(h) provides the opportunity for stakeholders and watershed groups to create Watershed Restoration Action Strategies that assess all the stressors present in a watershed that may be compromising water quality. Improving water quality becomes the vehicle for understanding all aspects of the watershed. The Watershed Protection Plan for the Arroyo Colorado Watershed in the Lower Rio Grande Valley is an excellent model for grappling

with the impacts of urbanization and agriculture on the ecosystem and for seeking best management practices to create resilient systems that can serve communities long into the future.

Strategically restore surface waters. To reduce the environmental damage from flood control works of the Rio Grande, Colorado, and Tijuana Rivers, strategic restoration is one approach being proposed. In the case of the Rio Grande, a 2003 report from The Alliance for Rio Grande Heritage and World Wildlife Fund notes that restoration activities could include lowering the floodplain to allow the channel to flood more frequently, and constructing side channels to connect low-lying areas away from the main channel. Another option would be to remove or breach levees in specific locations to increase the frequency of over bank flows. In other words, a natural flow cycle, which includes periodic floods, is good for the riparian ecosystem, water quality, system resiliency, and species protection.

Likewise, on the Colorado River, environmental organizations such as Environmental Defense and the Sonoran Institute have promoted the idea of restoring river meanders and providing for occasional flooding onto the banks as a means of restoring native cottonwood and willow habitat. When the river leaves the low-flow channel and inundates the adjacent floodplain (over bank flooding), it provides water for habitat restoration. Over bank flooding can occur while still containing the river in the flood control levees. Supporters point to studies demonstrating that native species in the Colorado River Delta region benefited significantly from flood events in the 1980s and 1990s.

These strategic restoration efforts are best accomplished with active participation of relevant Mexican agencies and organizations. Examples include Mexico’s National Commission for Natural Protected Areas (*Comisión Nacional de Áreas Naturales Protegidas*); the Mexico Section of the IBWC (*La Comisión Internacional de Límites y Agua*); CNA; state environmental agencies; and local and state water/wastewater treatment agencies (sometimes called *Juntas* or *Comisiones de Agua y Saneamiento*).

Incorporate ecosystem health goals into urban stormwater management plans. Border cities such as San Diego, Tijuana, El Paso, Ciudad Juárez, Las Cruces, Laredo, and Nuevo Laredo should prescribe buf-

fers, riparian strips, and wetlands that can capture and slow stormwater while benefiting wildlife. (It should be noted that U.S. cities with populations greater than 100,000 already have to obtain stormwater permits from the U.S. Environmental Protection Agency or the state delegated agency.)

Expand prescribed fires to maintain habitats for critically endangered species. The aplomado falcon, masked bobwhite quail, and the chaparral-dependent species of San Diego County are examples of species facing significant habitat loss in the borderlands. State and federal sponsored programs for prescribed fire to maintain their habitats should be instituted where absent and maintained where present. Education campaigns that impress on homeowners in fire prone areas techniques to keep their properties “fire safe” should become a high priority for border counties and states.

Identify, protect, and connect critical habitat. To protect critical natural areas and species from devastating effects of natural disasters, the Board recommends several steps. First, critical habitat areas must be identified and protected on both sides of the border. Second, efforts need to be made to connect critical habitat areas with protected areas, thus assuring that connected patches of habitat are large enough to maintain ecosystem and species health. Because many

important habitat areas are near each other across the international boundary, it is important to maintain unbroken connectivity. San Diego County has done an excellent job with its Multiple Species Conservation Program, but connection across the border with important habitats in Baja California is lacking.

To address this lack of connectivity, the Las Californias Binational Conservation Initiative, which is based on scientific research to identify priority species and habitats, has been proposed by U.S. and Mexican nongovernmental organizations. The effort is supported by the California Biodiversity Council, a coalition of local, state, and federal agencies.

Lack of transboundary connectivity can be found in other areas of the border as well. Examples are the New Mexico-Chihuahua border with the jaguar and the Texas-Tamaulipas border with the ocelot and the jaguarondi.

Consider protective measures for endemic species. In the Cedar Wildfire, a species of native coastal rainbow trout found in a number of rivers in the Cuyamaca Rancho State Park was completely wiped out. Fortunately, as mentioned earlier, a group of 16 had recently been placed in an aquarium at the Chula Vista Nature Center just prior to the fire. More consideration should be given to such measures, particularly for endemic species.



Natural Disasters

Effects on Specific Population Groups

Tribes

Twenty-six U.S. federally recognized Native American tribes live in the U.S.-Mexico border region. Some of these tribes have family and cultural ties to indigenous peoples in the northern border region of Mexico. For a variety of reasons, when natural disasters strike, border tribes often find themselves particularly at risk. For example, many residents of tribal areas live in dispersed housing that is scattered over the landscape and surrounded by native vegetation. These homes are vulnerable to wildfires and are difficult to evacuate.

Also, during the recovery phase, it is difficult to restore basic services to these properties.

Tribes already have taken steps to reduce their vulnerability. For example, some have pre-disaster mitigation plans, while others are awaiting approval on their plans. Some tribes have volunteer tribal fire departments, some have paid staff, and others have a Telecommunicator Emergency Response Taskforce or a Community Emergency Response Team.

Tribes in the Southern California border area are regularly affected by fires, as often as every 3 to 4 years.



Tribes' vulnerability to natural disasters became clear once again during the Southern California wildfires of October 2007. A total of 13 tribes evacuated their reservations. Shown is the Poomacha fire advancing across a hillside on La Jolla Band of Luiseno Indians land, near Escondido, California, on October 24. (Source: Indian Health Service.)

For instance, in 2003, several tribes in the San Luis Rey Watershed and Palomar Mountain area were impacted by the Paradise, Cedar, and Otay fires. In addition, in October 2007, tribes' vulnerability, unfortunately, was once again demonstrated during the Southern California wildfires—the Poomacha, Witch, and Harris fires. The La Jolla Band of Luiseño Indians witnessed more than 90 percent of their resources burned in the Poomacha fire. A total of 13 tribes evacuated their reservations. Three tribes were without power and water. Homes at several of the reservations were destroyed, water lines were melted, and water mains burst. Tribal evacuation centers were set up for displaced tribal families, and elders were bused to safer locations. The Red Cross set up field operations, and HUD formed a disaster response team that provided advice on how HUD resources might be used for rebuilding. Widespread concern remains about what future fires may bring to the area, especially for tribes such as the Santa Ysabel Band of Diegueño Indians, whose land has not burned in many decades.

Besides wildfires, border tribes continue to be affected by flooding. For example, in the El Paso area, the Ysleta del Sur Pueblo (YDSP) tribe of Texas suffered damage to tribal members' housing and land in August 2006 by the severe flooding that occurred in El Paso. According to tribal officials, the flooding also caused erosion, which was intensified because the in-

vasive shrub species that have come to dominate the area do not protect against erosion as well as the native grasses. Additionally, there were significant problems with mosquitoes and mold following the flooding.

To prepare for natural disasters and their aftermath, YDSP created an Emergency Planning Coordinator and an Emergency Planning Committee, along with an Emergency Management Plan that meets federal government requirements. The committee is composed of various departments (law enforcement, health, legal, government operations, etc.) that meet on a bimonthly basis. It also conducts training for both tribal members and other community members. It has participated in exercises with surrounding cities and counties and works in partnership with the City of El Paso, the City of Socorro, El Paso County, the State of Texas, and FEMA. Training partners include the Native American Fish & Wildlife Society and the Workplace Safety Training Program of the University of Alabama at Birmingham. Although the tribe has not worked directly with Ciudad Juárez, it is indirectly involved via one of its partners.

Like some other border communities, the YDSP and other tribes face a shortage of resources for natural disaster preparations and response. Tribal spokespeople have called for more communication and sharing of training opportunities as a means for building capacity. They also recommend that emergency planning committees contain all vital departments to be fully effective.

Colonias

“Colonias” are unincorporated communities or settlements along the U.S. border with Mexico that lack basic environmental infrastructure. (Note that in Mexico, a “colonia” is considered a regular neighborhood; the equivalent term in Mexico is “colonia popular.”)

Most of these settlements are informal or illegal, but local U.S. and Mexican authorities have not been able to prevent their formation. In recent decades, hundreds of such settlements have sprung up along the southern borders of New Mexico and Texas. As of January 1, 2008, there were 138 colonias in New Mexico. In Texas, according to a state government report published at the end of 2006, there was a total of 1,786 colonias with a combined population of ap-

proximately 360,000 in the six largest border counties alone. Current estimates put the total Texas colonias population at nearly 400,000.

Fortunately, conditions in many border-region colonias have improved in recent years through federal and state programs. A number of colonias residents, however, continue to live in substandard housing and have inadequate drainage, sewage, drinking water, and garbage disposal systems. They rely, instead, on substandard septic tanks, pit privies, or, in some cases, outhouses. Some of these communities also suffer from poor air quality as a result of conditions such as dirt roads in an arid climate, which increases the presence of dust (coarse particulate matter). Other issues include lack of proper drainage to ensure stormwater flows away from homes during rainstorms and control of blowing dust.

Colonias can be particularly hard hit during natural disasters because most of them were established without proper planning, urban services infrastructure, or enforced building codes. Many were built in flood plains or on steep slopes, and the housing quality often is poor. In addition, where environmental infrastructure does exist in colonias, it is fragile, making it unable to withstand floods and other events. For instance, inadequate wastewater systems can mean that sewage sometimes saturates streets during floods or heavy rains. That same flooding often poses a threat to groundwater. Drinking water systems and wells can be contaminated by overflowing stormwater. Another effect of flooding or heavy rainfall is damage to roads; dirt roads can turn into impassable mud. Residents sometimes are cut off from their community, with access to food and other supplies limited, garbage pick-up (where available) hindered, and school buses unable to pick up children.

New Mexico's colonias suffered extensive damage during flooding in 2006, as did El Paso-area colonias. Unfortunately, because rain events—especially in the

Lower Rio Grande Valley of Texas—often are so severe, and because many colonias are located in floodplains, flooding in Texas colonias occurs regularly. Witness the following description carried by the *Brownsville Herald* newspaper after Cameron County flooding in 2003: “Flooded farm fields, small towns and colonias are awash in stinky rainwater mixed with sewage from overflowing septic tanks. Health officials are preparing for a bumper crop of mosquitoes.”

Colonias in Mexican border cities are perhaps even more vulnerable to the effects of natural disasters than their counterpart settlements across the international boundary. Even less government control on planning of these settlements, denser settlements, and lower levels of infrastructure distinguish the Mexican informal communities. As noted previously, Mexican settlements also tend to appear in areas of steep slopes and canyon bottoms, areas not considered suitable by commercial developers.

Colonias' preparedness for natural disasters could potentially be enhanced through use of a tool developed by the U.S. Geological Survey in cooperation with the offices of the Texas Attorney General, Secretary of State, and the Texas Water Development Board called the Colonia Health, Infrastructure, and Platting Status (CHIPS) tool. It can be used to provide information to support infrastructure priorities in Texas. The tool's report generator can be tailored to the needs of the user, providing either broad or specific output. For example, CHIPS can be used to list colonias with wastewater issues in a specific county as well as all colonias with need of clinical access. Given that it provides both population database information and infrastructure data for each colonia in Texas, it may lend itself to a disaster preparedness tool. In fact, FEMA requested a copy and made use of its capabilities to respond to the 2006 flooding in El Paso.



SECTION Two

Managing Natural Disasters on the U.S.-Mexico Border

Natural Disasters United States: Domestic/International Policies/Institutions

The United States has a complex domestic system for preparing for, responding to, recovering from, and mitigating natural disasters. The system largely developed out of the need to manage incidents within the United States. It does not, however, adequately contemplate disasters in the border region of the United States that also impact parts of neighboring Mexico.

In the case of binational border natural disasters, the system is calibrated for rapid response only in the area covered by the disaster that lies north of the international boundary. Response on the other side of the border is left to Mexican authorities, despite transborder implications, unless the incident is declared a disaster by the U.S. Ambassador to Mexico and the Mexican federal government requests U.S. government assistance. In that case, formal transboundary cooperation on natural disaster response and recovery officially occurs primarily through a chain of communication involving Mexico City and Washington, D.C., namely the U.S. Department of State, the Office of Foreign Disaster Assistance at the U.S. Agency for International Development (USAID), and the Mexican Foreign Ministry.

Given that many border incidents may not be declared a natural disaster by one or both of the federal governments, local and state officials often must meet immediate emergency needs through informal local agreements and cooperation. As a result, transboundary natural disasters leave millions of U.S. border residents in transboundary communities with different levels of protection under the National Incident Management System (NIMS, discussed later) than resi-

dents in other parts of the nation.

U.S. domestic policy addresses incident management, including natural disasters, from the ground up. This approach is based on the recognition that local governments have several unique types of expertise: (1) pre-existing close working relationships with each other, (2) detailed familiarity with the populations they serve, and (3) specific geographic awareness of the impacts a potential threat could impart.

As a result, federal policy calls for emergency preparedness and disaster response to be handled at the lowest jurisdictional level(s) possible. Local, tribal, and state governments have primary responsibility for preparing their communities for a natural disaster and for responding first should a disaster occur. Federal assistance generally becomes available only when the resources of local, tribal, and/or state governments become overwhelmed. On occasion, however, particularly since Hurricane Katrina, the federal government has stepped in earlier in the process to pre-position resources in anticipation of a response.

A U.S. Government Accountability Office report issued in 2007 (GAO-07-403) reaffirms that a variety of natural hazard mitigation activities exist, and they are primarily implemented at the state and local level. Entitled *Natural Hazard Mitigation: Various Mitigation Efforts Exist, but Federal Efforts Do Not Provide a Comprehensive Strategic Framework*, the report states that although “FEMA [Federal Emergency Management Agency], other federal agencies, and nonfederal stakeholders have collaborated on natural hazard mitigation, the current approach is fragmented and does not

provide a comprehensive national strategic framework for mitigation. Collaboration typically occurs on a hazard-specific basis, after a disaster, or through informal methods. A comprehensive framework would help de-

fine common national goals, establish joint strategies, leverage resources, and assign responsibilities among stakeholders.”

Domestic Emergency Management Cycle

Whether managing a natural disaster or another type of emergency, four components generally are included in the cycle: preparedness, response, recovery, and mitigation. Clearly, mitigation activities after a disaster also feed into future planning and preparedness. Because of the binational nature of sister cities, the border region has specific vulnerabilities that complicate the execution of the emergency management cycle.

Preparedness

Activities undertaken in advance of an emergency. These activities develop operational capabilities and improve effective response to disasters. Disaster plans are developed and revised to guide disaster response and increase available resources.

Response

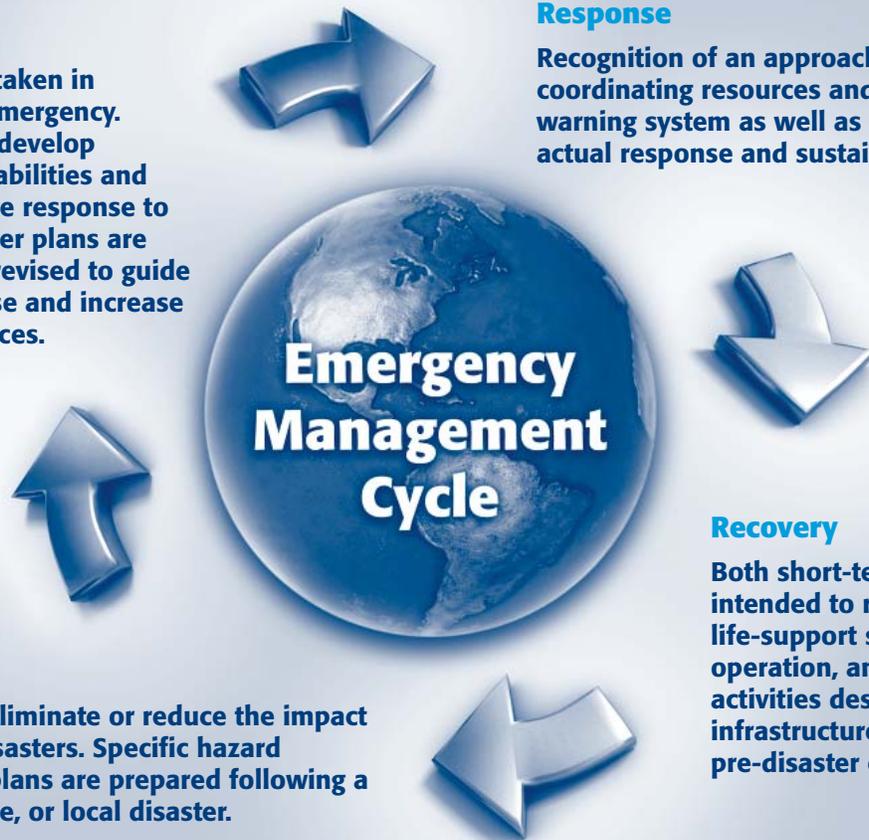
Recognition of an approaching disaster by coordinating resources and activating a warning system as well as responding to an actual response and sustaining support.

Recovery

Both short-term activities intended to return vital life-support systems to operation, and long-term activities designed to return infrastructure systems to pre-disaster conditions.

Mitigation

Actions to eliminate or reduce the impact of future disasters. Specific hazard mitigation plans are prepared following a federal, state, or local disaster.



Triggering Domestic Federal Assistance

Federal involvement typically occurs under the following circumstances: (1) local, tribal, and/or state jurisdictions already have responded to the incident; (2) the resources of these jurisdictions have become overwhelmed (or it is anticipated that they will be); and (3) the damage has been assessed by local, state, federal, and volunteer organizations to determine losses and

recovery needs. At that point, the governor(s) of the affected state(s) requests federal assistance.

Under the Stafford Act (*see text box*), federal assistance to help manage a natural disaster typically becomes available when “the disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that the federal assistance is necessary.” Only the President may proclaim a Major Disaster Declaration or an Emergency Declaration. To obtain

either, the governor of an affected state must make a declaration request to the President. A Major Disaster Declaration initiates the delivery of longer term federal recovery assistance programs and typically requires a commitment of state funds. An Emergency Declaration provides shorter term federal assistance for a specific emergency, or for the prevention of a major disaster, and does not activate the delivery of longer term federal recovery assistance programs.

Once a declaration is issued, a number of federal agencies become involved. Assistance available depends on which type of declaration is issued as well as the incident itself. Assistance generally falls into three categories: (1) individual assistance, including disaster housing, disaster grants, low-interest disaster loans, and other disaster assistance programs; (2) public assistance, which helps state or local governments fund the costs of rebuilding a community's damaged

Federal Authority for Managing Domestic Natural Disasters and Other Incidents

Numerous laws, regulations, guidance documents, and directives create the web of authority for federal activities related to natural disasters. Following are descriptions of several of the key documents.

Laws

The Homeland Security Act of 2002 transferred numerous agencies and functions, including FEMA and several preparedness branches of the Department of Justice (DOJ) and HHS, to the Department of Homeland Security (DHS). The Homeland Security Act assigned to DHS the responsibilities of consolidating and coordinating U.S. emergency prevention, preparedness, response, and recovery. Public Law 107-296 (2002).

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) establishes programs and procedures for the federal government to provide assistance to state, local, and tribal governments, as well as individuals and private nonprofit organizations, in the event of a disaster or emergency. It sets out the authority for federal disaster preparedness and relief programs and includes the procedures through which state governors request federal assistance and disaster declarations when combined state and local resources are insufficient to manage an incident. 93 Public Law 288 (1974), as amended.

Executive Orders

Executive Order 12148 (Federal Emergency Management) designates FEMA as the primary federal agency for coordination of federal disaster relief, emergency assistance, and emergency preparedness. With the notable exception of the authority to declare a major disaster or emergency, the executive order also delegates to FEMA the responsibility for numerous relief and assistance functions formerly vested in, or transferred to, the President under disaster-related laws (including the Stafford Act). 44 Federal Register 43239 (1979), as amended by Executive Order 13286, 68 Federal Register 10619 (2003).

Executive Order 13286 amended previous executive orders and other actions, including Executive Order 12148, in connection with the restructuring of federal departments and agencies responsible for incident management and emergency response, and with the transfer of certain functions to the Secretary of Homeland Security. 68 Federal Register 10619 (2003).

Homeland Security Presidential Directives (HSPDs)

HSPD-5 (Management of Domestic Incidents, February 28, 2003) requires development of a single national incident management system, which has led to development of the NIMS, and of a national response plan, resulting in development of the National Response Plan (NRP). A successor to the NRP, the National Response Framework (NRF), was released on January 22, 2008, and is set to go into effect on March 22, 2008. It also designated the Secretary of Homeland Security as the "principal federal official for domestic incident management."

HSPD-8 (National Preparedness Goal, December 17, 2003) requires the development of a national preparedness goal to enhance federal prevention of, and response to, emergencies, particularly the effectiveness, efficiency, and timely delivery of federal preparedness assistance to state and local governments.

infrastructure, including debris removal and grants for public schools; and (3) hazard mitigation, which assists both individuals and public entities with measures to reduce or eliminate damage caused by future disasters. These measures may include elevation or relocation of flood-prone homes or retrofitting buildings to make them better able to withstand the impacts of earthquakes or strong winds.

Besides the two types of declarations available under the Stafford Act, many federal departments and agencies have independent authority to provide specific types of incident assistance and support (*see Roles of Federal Agencies below*). Note that, in some cases, an agency's official authority includes natural disasters, whereas in others it may only include emergencies such as transportation accidents involving the release of hazardous materials. For example, the U.S. Army Corps of Engineers (USACE) can issue a disaster declaration in response to flooding and coastal storms, whereas the U.S. Environmental Protection Agency (EPA) has authority to respond to sudden threats to public health or the environment caused by inland releases of oil or hazardous substances. When natural disasters involve tribal entities, the Bureau of Indian Affairs and Indian Health Service (under the Department of Health and Human Services [HHS]) are involved.

Coordinating Federal Assistance

NRP and NIMS. Following the September 11, 2001, attacks on the World Trade Center and the Pentagon, the DHS was created and designated the umbrella federal incident management agency. To help DHS strategically oversee the work among the many entities involved in managing incidents, the NRP and the NIMS were developed. These post-9/11 actions initiated a period of transition for domestic incident management, and the United States arguably remains in that period of transition.

Developed to deal with all incidents of varying type, magnitude, and severity, the NRP's primary purpose is to facilitate coordination among federal, state, tribal, and local governments, as well as private and nonprofit organizations. The NRP has five components: (1) a Base Plan that relies on the NIMS (see below) as an organizational template for coordination; (2) appendices that provide additional authorities, references, and

resources; (3) Emergency Support Function Annexes that describe the roles of federal agencies and departments; (4) Support Annexes with additional subject-specific information such as international coordination; and (5) Incident Annexes, which describe specific incident management activities for particular types of incidents.

Particularly relevant to emergency response in the U.S.-Mexico border region is the NRP's Support Annex on International Coordination (IC Annex). The IC Annex discusses the Department of State's responsibilities as the coordinating federal agency for incidents with an international component—responsibilities such as expediting visa issuance of foreign experts if needed; working with the International Red Cross and Red Crescent Movement to assist family members in locating loved ones in an affected area; coordinating U.S. government requests for foreign or international multilateral (e.g., United Nations [UN], North Atlantic Treaty Organization) assistance; and advising on the diplomatic, economic, and security implications of border restrictions or closure.

The IC Annex of the NRP also discusses international coordination associated with many of the emergency support functions (ESFs) (*see table*). The IC Annex lists the following as “cooperating agencies”: the U.S. Department of Agriculture (USDA); Department of Defense (DOD); HHS; DHS; DOJ; Department of Transportation (DOT); USAID; other federal agencies; and the American Red Cross.

Perhaps significantly within the international context, although the NRP mentions the U.S.-Mexico Marine Joint Contingency Plan (Marine JCP), it does not mention the Joint United States-Mexico Contingency Plan for Preparedness and Response to Environmental Emergencies Caused by Releases, Spills, Fires, or Explosions of Hazardous Substances in the Inland Border Area (Inland JCP) (*see Binational Arrangements section*). Both the Marine and Inland JCPs, however, are important frameworks for coordination with Mexico in the event of polluting incidents, and therefore would significantly strengthen the NRP if included.

The NIMS is the template that was used in developing the NRP. It provides a consistent framework for incident management at all jurisdictional levels regardless of the cause, size, or complexity of the incident. This consistent framework enables responders from

U.S. National Response Plan (NRP): Federal Agency ESF and Responsibilities in the Case of Domestic Disasters

NOTE: A declared disaster on the Mexican side of the border would trigger a different set of functions/responsibilities from the U.S. government if the Mexican government requested assistance.

Emergency Support Function	Primary Department or Agency	State Department Responsibilities within the International Context
1. Transportation	Department of Transportation	When the U.S. Government considers transportation and border restrictions/closures, the State Department must provide guidance on overall diplomatic, economic, and security implications. Specific areas include: <ul style="list-style-type: none"> • Restrictions on international air travel. • Clearance of foreign aircraft and marine vessels.
2. Communications	Department of Homeland Security (DHS) (Information Analysis and Infrastructure Protection/National Communications System)	<ul style="list-style-type: none"> • Facilitate communications for response to international cyber-CIP failures and related incidents. • Work to effect multilateral efforts to create a "global culture of cybersecurity."
3. Public Works and Engineering	Department of Defense (U.S. Army Corps of Engineers) and DHS (Federal Emergency Management Agency [FEMA])	[No responsibilities detailed in the International Coordination Support Annex]
4. Firefighting	U.S. Department of Agriculture (USDA) (Forest Service)	Coordinate with foreign governments and DHS on identification and movement to the United States of assets and resources for firefighting assistance.
5. Emergency Management	DHS (FEMA)	[No responsibilities detailed in the International Coordination Support Annex]
6. Mass Care, Housing, and Human Services	DHS (FEMA) and American Red Cross	<p>Coordinate with foreign governments on identification and movement to the United States of mass care assets and resources for response and recovery activities.</p> <p>As requested by foreign governments, act as liaison with local authorities to enable foreign missions to provide consular access and safety/security assistance to its nationals in the United States.</p>
7. Resource Support	General Services Administration (GSA)	[No responsibilities detailed in the International Coordination Support Annex]
8. Public Health and Medical Services	Department of Health and Human Services	<ul style="list-style-type: none"> • Work with U.S. agencies, the World Health Organization, other international organizations, and nations on surveillance activities and countermeasures to reduce the spread of biological contaminants and facilitate the delivery of vaccines, blood products, and medicines. • Support federal agencies to facilitate the transfer of dangerous pathogen samples from and to the United States. • Facilitate coordination between domestic and international public health and law enforcement efforts.
9. Urban Search and Rescue	DHS (FEMA)	<ul style="list-style-type: none"> • Coordinate with foreign governments, if requested, on identification and movement to the United States of urban search and rescue assets. • Articulate U.S. needs to the world community through the UN.
10. Oil and Hazardous Materials Response	U.S. Environmental Protection Agency and DHS (U.S. Coast Guard)	Support the entire spectrum of incident management.
11. Agriculture and Natural Resources	USDA and the Department of the Interior	Facilitate the exchange between the United States and foreign nations to identify the nature of the threat, impede disease spread, and take immediate remedial actions.
12. Energy	Department of Energy (DOE)	Support DOE work with the governments of major oil-consuming countries through the International Energy Agency and other groups to maintain readiness to respond to energy emergencies such as a disruption in oil supplies.
13. Public Safety and Security	Department of Justice	[No responsibilities detailed in the International Coordination Support Annex]
14. Long-Term Community Recovery	USDA, Department of Commerce, DHS (FEMA), Department of Housing and Urban Development, Treasury, and Small Business Administration	Support all agencies and the international community on long-term recovery efforts.
15. External Affairs	DHS (FEMA)	Support the DHS diplomacy and public affairs to ensure a consistent the message to foreign and domestic stakeholders.

Sources: Information obtained from Table 2.1 of *The Federal Response to Hurricane Katrina: Lessons Learned* (February 2006), page 16; Figure 2 of the NRP (December 2004), page 12; the table entitled "International Coordination Associated With Emergency Support Functions (ESFs)" in the International Coordination Support Annex, INT-5, of the NRP (December 2004); and the Notice of Change to the NRP (May 25, 2006).

different jurisdictions and disciplines to work together more effectively. For example, it assigns a specific title for each type of responsibility and a specific chain of command that should be used to manage every incident. HSPD-5 specifies that beginning in Fiscal Year 2005, all recipients of federal preparedness awards must implement the NIMS.

NRP to NRF. Not long after the NRP and NIMS were developed, Hurricane Katrina provided a large-scale test of these systems. Following the coordination issues that surfaced as the nation scrambled to respond, both the NRP and the NIMS began to be revised to incorporate lessons learned. Among other changes, the revised NRP, to be replaced by the NRF on March 22, 2008, sets out to clarify issues such as what triggers implementation of the NRP. It also emphasizes that an anticipatory response may be most appropriate when merely the threat of a significant incident exists.

Other planning tools. In addition to relying on the NRP/NRF, some federal agencies independently have developed planning tools to address their particular areas of substantive jurisdiction during an incident. For example, HHS has developed the Planning Tool for Public Health Effects During Natural Disasters. The HHS Planning Tool charts natural disaster events (such as floods, earthquakes, landslides, wildfires) and public health contingencies (such as dealing with deaths, injury prevention and control, loss of clean water supply, loss of shelter, loss of routine hygiene, increased pests and vectors, loss of electricity), ranking the likely prevalence of each contingency throughout an affected population during each type of event (e.g., focal, widespread, rare, likely).

In addition, EPA is developing a planning tool that local communities (e.g., cities, counties, and tribes) can use to develop plans for managing debris that results from natural disasters.

Role of Federal Agencies in Managing Domestic Incidents

Many Federal agencies play a part in the emergency management cycle. In some cases, their role primarily is during the preparedness and response portion, whereas other agencies step in during recovery and

mitigation/rebuilding; still others are involved in multiple phases. For example, at the front end of the cycle, the U.S. Geological Survey, within the Department of the Interior (DOI), issues notifications and warnings for earthquakes, volcanoes, and landslides. DHS oversees the national effort to manage all types of hazards. FEMA, within DHS, mobilizes and organizes entities during a disaster and also administers the National Flood Insurance Program. During emergencies, federal agencies also extemporaneously assist where necessary, as EPA did with its search and rescue efforts in the aftermath of Hurricane Katrina.

The National Response Team, comprising 16 federal agencies, has responsibility for effective national preparedness and response for oil and hazardous materials spills. The USDA Forest Service fights and manages wildfires. In addition, the National Wildfire Coordinating Group (NWCG) is made up of the USDA Forest Service; four DOI agencies—the Bureau of Land Management, the National Park Service, the Bureau of Indian Affairs, and the Fish and Wildlife Service; and state forestry agencies through the National Association of State Foresters. Its purpose is to coordinate programs of the participating wildfire management agencies and foster cooperation. The NWCG provides a formalized system to agree on standards of training, equipment, qualifications, and other operational functions.

DOT has a Regional Emergency Transportation Program to ensure that the DOT role in National Response Planning is accomplished. This program resides under the leadership of DOT Regional Emergency Transportation Coordinators and Representatives who are responsible for developing preparedness plans; conducting training; maintaining interdepartmental, federal, state, and local organization coordination; and supporting FEMA's response under the NRP.

The recovery and rebuilding/mitigation portion of the cycle portion also brings in numerous agencies. For instance, HHS together with DHS coordinates federal public health and medical care assistance; HUD works with local organizations after floods to address mold and mosquito control, as well as rebuilding. In addition, the Natural Resources Conservation Service, within USDA, carries out debris removal from clogged streams caused by flooding, installs conservation measures such as reseeding native grasses to prevent soil

erosion on hillsides after a fire, and replants and reshapes farmland stream banks that have eroded after a flood. Also managed by USDA is the Wetlands Reserve Program, a voluntary program to restore wetlands, which, in turn, help to minimize future flood damage.

In addition, managing a natural disaster along the U.S.-Mexico border often includes an international dimension, and several federal agencies play a particularly central role. The State Department coordinates international response efforts and requests for aid from foreign governments; USAID, particularly its Office of Foreign Disaster Assistance (OFDA), also may play a key role. Because international response can become a central feature of effectively managing natural disasters in the border area, the roles of the State Department and USAID are discussed more fully below.

Role of Federal Agencies in Managing International Incidents

State Department and USAID. The State Department plays a central role in coordinating the U.S. response to foreign disasters by providing assistance to American citizens abroad and by serving as the focal point for contact with foreign governments. It exercises these responsibilities through several mechanisms.

First, the Secretary of State provides overall foreign policy guidance to the USAID OFDA. USAID, in turn, is the principal U.S. agency to extend assistance to other countries recovering from disasters once the U.S. Ambassador to the affected country has made a declaration of disaster and the foreign government has requested assistance. The USAID OFDA offers emergency assistance, funds mitigation activities to reduce the impact of recurrent natural hazards, and provides training to build local capacity for disaster management. In addition, OFDA deploys teams of disaster specialists to assess damage, determine appropriate assistance levels, and coordinate with other U.S. government and nongovernmental responders. In the case of Mexico, USAID OFDA most recently provided more than \$2.1 million in response to the devastating floods in the states of Tabasco and Chiapas in November 2007 and deployed a five-person assessment team to the flood-affected area to determine priority needs in consultation with the U.S. Embassy and the Government of Mexico.

The U.S. Embassy and Consulates in the impacted country also play a critical role by becoming the central hubs for disseminating information to local Americans and liaising with host-country government on disaster response. Depending on the size of the disaster, the State Department in Washington, D.C., and/or embassies may form task forces to manage the U.S. response (as was the case with the 2003 tsunami that impacted Thailand, Indonesia, and other parts of Asia). In Mexico, U.S. consulates often must take the first action in any anticipated hurricane, assisting American citizens in the area, deploying staff to the anticipated affected area, and maintaining contact with foreign officials. Embassy personnel also may be deployed to hard-hit areas to shore up consulate staff. In addition to maintaining open lines of communication—critical during a disaster—the U.S. Ambassador also has the authority to release up to \$50,000 in immediate disaster aid to foreign governments.

Besides its work in the field, the headquarters office of the State Department in Washington, D.C., has particular responsibilities for responding to both foreign and domestic disasters. The office serves as the primary conduit for communicating with U.S. diplomatic posts, disseminates critical information to U.S. media outlets, and works with other U.S. agencies.

In the case of catastrophic domestic disasters, such as Hurricane Katrina, it is the State Department's responsibility to coordinate offers of foreign assistance. In the aftermath of Hurricane Katrina, the United States accepted foreign assistance—something that the United States had never done on such a large scale. As a result, the State Department, FEMA, and USAID OFDA have worked closely together to develop the International Assistance System (IAS), which establishes standard operating procedures for requesting assistance, determining if resources can be procured internationally, reviewing offers, determining acceptability of offers, managing logistics, and distributing resources. Additional U.S. agencies involved in IAS include DHS, DOS, USDA, and others.



Next Steps for Existing Frameworks and Capabilities

Further clarify the National Response Plan (NRP)/National Response Framework (NRF). The

concepts, principles, and initiatives of the NRP/NRF are extremely useful to coordinate the complicated web of local, state, tribal, and federal responders and their numerous independent and co-dependent responsibilities. Some additional clarification, however, would strengthen the framework. For example, clarify the chain of command and what is coordinated when to facilitate quick and efficient responses. The “clarify what is coordinated when” issue has implications, for instance, for whether FEMA or federal agencies (using their own resources) pay for the costs of the response.

Adapt the NRP’s Support Annex on International Coordination to enable rapid response to border-region natural disasters. As mentioned earlier, although the NRP mentions the U.S.-Mexico Marine Joint Contingency Plan (Marine JCP), it does not mention the Joint United States-Mexico Contingency Plan for Preparedness and Response to Environmental Emergencies Caused by Releases, Spills, Fires, or Explosions of Hazardous Substances in the Inland Border Area (Inland JCP) (*see Binational Arrangements section*). Both the Marine and Inland JCPs, however, are proven and successful plans for binational emergency response coordination, and therefore important frameworks for coordination with Mexico in the event of polluting incidents. Even if not mentioning the Inland JCP in the original NRP was merely an oversight, including it in the forthcoming version would strengthen the NRP/NRF.

Build capacity so that the necessary technology and experienced decisionmakers at all levels are available in the field during a response, including newer players. Events such as Hurricane Katrina and the Southern California wildfires of 2007 have proven that responders at all levels must have the capacity to quickly and effectively respond. Emergency preparedness and response has become a shared responsibility among all levels of government—local, state, tribal, and federal—as well as the private and nonprofit sectors.

To build this capacity and address the disparate levels of expertise and understanding, newer responders could draw from the experience of more historical responders such as experienced state and local responders and the Forest Service, EPA, and Coast Guard.

One mechanism would be to engage in experienced responder-led training and information exchanges. Proactively preparing and training for disasters may be among the most effective means to mitigate their impacts. In addition, experienced responders are encouraged to reach out to the private sector to ensure, for example, that large employers in border communities have policies, procedures, and trained personnel in place to manage natural disasters.

Role of the Private Sector

In the U.S.-Mexico border region, many large companies have set up operations on both sides of the border. Some are involved in manufacturing, whereas others are involved in trade as well as wholesale and retail operations.

Private sector operations along the U.S.-Mexico border should be included in all discussions regarding preparation and response to disasters caused by natural hazards. Many companies have operations on both sides of the border, and their employees live in both Mexico and the United States. Many companies have in-plant medical staffs, secure communication systems across the border, large warehouses, and fleets of buses—all of which can be brought to bear during an incident.

Large companies, during and after an incident, have responsibilities for the welfare of company personnel, making sure the company comes through the incident, and assisting where possible in the larger community. Internationally, forward-looking companies and governments are instituting policies for emergency management; for example, an ISO standard (certified by the International Organization for Standardization and verifiable by an independent party) for emergency management has been approved by Israel. A primary goal of these policies is to enable companies to survive disasters and recover rapidly, preserving jobs and economic output.

Sony Electronics, Inc., provides one example of a border-region company with strategic planning measures in place for the onset of natural disasters. Headquartered in the Rancho Bernardo area of San Diego, one of the areas hard hit by the October 2007 wildfires, the company’s response to the disaster was coordinated through the provisions of its Business Con-

tinuity Plan. The Plan provides extensive procedures for assisting employees in advance of, during, and following the disaster. It also includes procedures for coordinating with government agencies taking the lead in the overall community response. Before the onset of the disaster, hazardous chemicals were stored in noncombustible areas and secured. During and after the disaster, the company followed the Plan's provisions for cooperation with the Red Cross and access to legal and insurance services. According to company officials, Business Continuity Plans are expected at all Sony facilities, including those in Mexico.

In some areas, company plans have been coordinated through local business associations. One example is the Matamoros Local Mutual Assistance Committee (*Comité Local de Ayuda Mutual*, CLAM). Created in 1986 by local industry, CLAM structure and activities are patterned after guidelines of a U.S. program called Community Awareness and Emergency Response. CLAM establishes and reviews industry emergency response plans for potential incorporation into those of the community. Upcoming activities include testing hurricane plans in both Matamoros and the neighboring U.S. city, Brownsville, Texas.



The October 2007 wildfires in Southern California destroyed 2,000 homes and caused well over \$2 billion in damage. Left: Friends and volunteers sift through rubble in the Rancho Bernardo section of San Diego. Right: Helicopters drop water and retardant on the Harris fire, near the Mexican border, in an effort to stop the wildfires from advancing further. (Source: Andrea Booher, Federal Emergency Management Agency)

U.S. BORDER STATE MAJOR DISASTER DECLARATIONS (Border Counties Specified)

California

Declared Date:	October 24, 2007
Incident Period:	October 21, 2007–March 1, 2008
Incident Type:	Wildfires
Assistance Type:	Individual and Public Assistance & Hazard Mitigation Grant Program (San Diego County and others)
Declared Date:	April 14, 2005
Incident Period:	February 16–23, 2005
Incident Type:	Severe Storms, Flooding, Landslides, and Mud and Debris Flows
Assistance Type:	Public Assistance & Hazard Mitigation Grant Program (San Diego Counties)
Declared Date:	February 4, 2005
Incident Period:	December 27, 2004–January 11, 2005
Incident Type:	Severe Storms, Flooding, Debris Flows, and Mudslides
Assistance Type:	Individual Assistance (San Diego County) Public Assistance (San Diego County) Hazard Mitigation Grant Program (San Diego County)
Declared Date:	October 27, 2003
Incident Period:	October 21, 2003–March 31, 2004
Incident Type:	Wildfires
Assistance Type:	Individual Assistance & Public Assistance (San Diego County) Hazard Mitigation Grant Program (All)
Declared Date:	February 9, 1998
Incident Period:	February 2–April 30, 1998
Incident Type:	Severe Winter Storms and Flooding
Assistance Type:	Individual Assistance & Public Assistance (San Diego County) Hazard Mitigation Grant Program (All)

Arizona

Declared Date:	September 7, 2006
Incident Period:	July 25–August 4, 2006
Incident Type:	Severe Storms and Flooding
Assistance Type:	Public Assistance (Pima County and the Tohono O'odham Nation) Hazard Mitigation Grant Program (All)
Declared Date:	July 14, 2003
Incident Period:	June 17–July 15, 2003
Incident Type:	Wildfire (Aspen Fire)
Assistance Type:	Public Assistance (Pima County) Hazard Mitigation Grant Program (All)
Declared Date:	October 27, 2000
Incident Period:	October 21–November 8, 2000
Incident Type:	Severe Storms and flooding
Assistance Type:	Public Assistance (Cochise and Santa Cruz Counties) Hazard Mitigation Grant Program (All)

New Mexico

New Mexico
 Declared Date: August 30, 2006
 Incident Period: July 26, 2006, and continuing
 Incident Type: Severe Storms and Flooding
 Assistance Type: Individual Assistance (Doña Ana and Otero Counties)
 Public Assistance (Doña Ana, Grant, Hidalgo, and Luna Counties)
 Hazard Mitigation Grant Program (All)

Declared Date: September 22, 1999
 Incident Period: July 16–August 7, 1999
 Incident Type: Severe Storms and Flooding
 Assistance Type: Public Assistance (Doña Ana and Luna Counties)
 Hazard Mitigation Grant Program (All)

Texas

Declared Date: August 15, 2006
 Incident Period: July 31, 2006
 Incident Type: Flooding
 Assistance Type: Individual Assistance (El Paso County)
 Public Assistance (El Paso and Hudspeth Counties)
 Hazard Mitigation Grant Program (All)

Declared Date: January 11, 2006
 Incident Period: December 1, 2005, and continuing
 Incident Type: Extreme Wildfire Threat
 Assistance Type: Public Assistance (All)
 Hazard Mitigation Grant Program (All)

Declared Date: September 24, 2005
 Incident Period: September 23, 2005, and continuing
 Incident Type: Hurricane Rita
 Assistance Type: Public Assistance (All)
 Hazard Mitigation Grant Program (All)

Declared Date: November 5, 2002
 Incident Period: October 24–November 15, 2002
 Incident Type: Severe Storms, Tornadoes, and Flooding
 Assistance Type: Individual Assistance (Cameron and Hidalgo Counties)
 Hazard Mitigation Grant Program (All)

Declared Date: September 26, 2002
 Incident Period: September 6–30, 2002
 Incident Type: Tropical Storm Fay
 Assistance Type: Individual Assistance (Webb County)
 Hazard Mitigation Grant Program (All)

Declared Date: August 22, 1999
 Incident Period: August 22–26, 1999
 Incident Type: Hurricane Bret
 Assistance Type: Individual Assistance and Public Assistance (Cameron, Hidalgo, and Webb Counties)
 Hazard Mitigation Grant Program (All)

Declared Date: August 26, 1998
 Incident Period: August 22–31, 1998
 Incident Type: Tropical Storm Charlie (Heavy Rain and Flooding)
 Assistance Type: Individual & Public Assistance (Kinney, Maverick, Val Verde, and Webb Counties)
 Hazard Mitigation Grant Program (All)

EMERGENCY DECLARATIONS

All

Declared Date: September 13, 2005
 Incident Period: August 29, 2005, and continuing
 Incident Type: Hurricane Katrina Evacuation
 Assistance Type: Specifically, FEMA is authorized to provide Public Assistance Category B (emergency protective measures), including direct federal assistance, at 100 percent federal funding.

Texas

Declared Date: February 1, 2003
 Incident Period: February 1, 2003
 Incident Type: Loss of Space Shuttle Columbia
 Assistance Type: Public Assistance (Cameron and El Paso Counties)

Declared Date: September 1, 1999
 Incident Period: August 1, 1999, and continuing
 Incident Type: Extreme Fire Hazards
 Assistance Type: Emergency Services (Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, Kinney, Presidio, Terrell, and Val Verde Counties)

Declared Date: June 23, 1998
 Incident Period: N/A
 Incident Type: Severe wildfire potential
 Assistance Type: All 254 counties for Direct Federal Assistance, to include reimbursement for the eligible costs associated with prepositioning assets from the Emergency Management Assistance Compact. The Compact is an agreement between or among states to provide assets when possible.

FIRE MANAGEMENT ASSISTANCE DECLARATIONS

California

2005 – Border 50 Fire (San Diego County)
 2003 – Mataguay Fire (San Diego County)
 2003 – Paradise Fire (San Diego County)
 2003 – Cedar Fire (San Diego County)
 2002 – Pines Fire (San Diego County)
 2002 – Gavilan Fire (San Diego County)

Arizona

2003 – Ash Fire (Cochise County)
 2003 – Aspen Fire (Pima County)

Texas

1998 – Cibolo Creek fire (Presidio County)
 1998 – Paradise Fire (Jeff Davis County)

Note: Other Fire Management Assistance Declarations posted on Web site without county specification are not included in this list.
 Source: <http://www.fema.gov>. Note that only U.S.-border counties are listed; other nonborder counties also included in original table.

Natural Disasters

Mexico: Domestic/International Policies/Institutions

The primary federal Mexican entity responsible for immediate response to natural disasters is the National Council for Civil Protection (*Protección Civil*), which falls under the authority of the federal Secretariat of Government (*Secretaría de Gobernación*, SEGOB) and has state-level coordinators throughout the country. Its mission is to coordinate the National System for Civil Protection (*Sistema Nacional de Protección Civil*, SINAPROC), an arrangement of public and private organizations at the federal, municipal, and local, levels in Mexico with the purpose of protecting citizens against disasters. Well-organized and trained, *Protección Civil* is known for providing timely and effective assistance to Mexican citizens during natural disasters/events, including evacuation and shelter set-up before and during hurricanes.

The SINAPROC national emergency response plan emphasizes the need for coordination among local, state, and federal levels of government. The plan designates municipal administrations as the first responders to natural disasters and other emergencies. If they lack the capacity to solve the problem, they turn to the state government for relief; if state governments still are overwhelmed by the disaster, they turn to the federal government, both *Protección Civil* and the Natural Disasters Fund, which has resources for relief.

SEGOB may declare a state of emergency when an imminent natural threat (or high probability of one) poses significant risk to human life and would require rapid mobilization. Once a state of disaster is declared, SEGOB is legally mandated to establish international agreements for civil protection and is responsible for coordinating both federal and, with the Secretariat of Foreign Relations (*Secretaría de Relaciones Exteriores*), international aid. According to the 1986 *Basis for the Establishment of the National System for Civil Protection*, Mexico at that time had binational cooperation agreements with the United States that could be used for

binational emergency response in the border region. In addition, in the 2006 *Manual for the Organization and Operation of the National System for Civil Protection*, *Protección Civil* establishes the criteria for the fulfillment of international agreements and cooperation.

Mexico can be a valuable ally in responding to domestic disasters in the United States. As noted previously, in the wake of Hurricane Katrina, the Government of Mexico sent a convoy of unarmed soldiers to the United States to provide food and medical supplies to victims who had lost their homes. Mexico also sent a navy vessel to the Mississippi coast area with rescue vehicles and helicopters to aid evacuation efforts. Although there were some problems coordinating the acceptance of the assistance, the experience has led the U.S. federal government to develop a new system to better receive foreign assistance, as discussed earlier. In addition, Mexican emergency responders form part of the Border Agency Fire Council, discussed in more detail in the Spotlight on Promising Partnerships section.

Mexican states, including those along the border, have their own local civil protection laws that delegate responsibilities to the municipal administrations. For example, the Baja California Civil Protection Law establishes the State Council for Civil Protection, which has the legal mandate to reach agreements with first response authorities of the “border region,” perhaps implying both Mexican and United States agencies. The Coahuila Civil Protection Law gives the Director for Civil Protection the authority to contact international organizations, public or private, in case of emergency. The Nuevo León and Tamaulipas Civil Protection Laws establish that international volunteer groups can register with the Municipal Civil Protection Unit to participate in emergency response actions.



Natural Disasters

Binational Arrangements

In 1980, the two governments signed an agreement providing for the establishment of a U.S.-Mexico Consultative Committee on Natural Disasters (as mentioned in Introduction). Membership includes FEMA, the State Department, the Southwest Border Regional Commission, and Mexico's Secretariats of Government, Foreign Relations, National Defense, Navy, Treasury and Public Credit, Communications and Transport, Human Settlements and Public Works, and Health. The purpose of the agreement is to foster cooperative information sharing and planning in the border region for natural disaster preparedness. The Committee's mandate includes exchange of information and personnel, risk assessments, training, study of damage assessment techniques, and study of the role of communications in emergency planning.

The agreement also specifies that each country shall do its best to facilitate prompt entry into and exit from its territory of personnel, materials, and equipment involved in cooperative programs under the agreement. Under the agreement, the Committee is to meet at least annually and may establish joint working groups with participation of other federal, state, or local governments and the private sector. To date, implementation of the 1980 Agreement has been limited. Officials at the working level from both governments, however, hope to meet in early 2008 to begin updating the agreement to make it more effective in the event of a disaster on either side of the border.

Besides the 1980 Agreement, recent decades have seen additional U.S.-Mexico partnerships created to jointly move forward in areas of mutual interest, including assisting each other in times of emergency. Yet, officially recognized binational emergency preparedness and response remains largely limited to chemical and oil spills. Only in a few cases do current binational institutions and agreements also incorporate natural disasters as an issue they cover. The potential to expand from "spills only coverage" to "all hazards coverage" is a key point that should be considered by policymakers and hopefully will be addressed in the update of the 1980 bilateral agreement.

Besides the limited coverage of many existing binational agreements, other challenges remain in the form of legal, regulatory, operational, logistical, and financial barriers. Legal and regulatory challenges make it difficult to determine the kinds of help that can be given and accepted, and determining this during an emergency can be a time-consuming process. Also, medical licensing and credentialing varies from country to country, raising questions in regards to interoperability. Furthermore, accepting the support of foreign personnel during an emergency typically requires customs duties, passport requirements, and resource manifests to be waived. Types of resources and communications equipment also vary, which can pose interoperability challenges (see Board's Tenth Report).

Following are descriptions of several institutions and agreements that figure strongly in binational policies related to emergency management.

International Boundary and Water Commission

The International Boundary and Water Commission (IBWC) plays a major part in flood control work. Established by treaty, the IBWC is responsible for applying the boundary and water treaties between the United States and Mexico. It has both a U.S. Section (USIBWC) and a Mexican Section (*La Comisión Internacional de Límites y Agua*, CILA), a structure that provides a solid foundation for transboundary cooperation.

IBWC currently maintains flood control projects at a number of critical locations along the border. One of the most extensive systems is located in the Lower Rio Grande Valley of Texas-Tamaulipas, an area especially vulnerable to widespread flooding from hurricanes and tropical storms. Other binational flood control projects include the Rio Grande Rectification Project, which includes levees and floodways through El Paso, Texas-Ciudad Juárez, Chihuahua; a system of levees and berms along the Rio Grande near Presidio, Texas-Ojinaga, Chihuahua; river levees along the Colorado River near

Yuma, Arizona-Mexicali, Baja California; channel improvements at Nogales, Arizona-Nogales, Sonora; and a concrete flood control channel and levees for the Tijuana River, which enters the United States at the San Diego, California-Tijuana, Baja California, border.

Giving additional flood protection are two international storage reservoirs built by the IBWC—Falcon Dam near Roma, Texas-Nueva Ciudad Guerrero, Tamaulipas, built in 1953, and Amistad Dam near Del Rio, Texas-Ciudad Acuña, Coahuila, completed in 1969. Both dams play an important role in controlling Rio Grande floods and protecting the Lower Rio Grande Valley. Recent inspections suggest that additional studies and strategies are needed to protect the stability of Amistad Dam from the effects of naturally occurring sinkholes.

To provide adequate flood protection in the border region, the USIBWC has developed plans for flood control system rehabilitation in Doña Ana County, New Mexico, and El Paso, Hidalgo, and Cameron Counties, Texas. The USIBWC also is coordinating with CILA to jointly undertake planning activities. The goal of this effort is to restore the old levees to their original de-

sign capacity (IBWC) and to FEMA standards; for the international reach, the capacity was previously agreed to by both countries, each of which is responsible for maintaining its levees to the agreed standard. During 2007, the USIBWC completed a significant levee-raising project in El Paso County, with more work planned in the future.

The Lower Rio Grande Flood Control Project in South Texas is where the most work is required—an estimated \$125 million to raise and rehabilitate U.S. levees. In some areas, the 100-year flood would overtop levees by as much as 6 feet in this hurricane-prone region. The USIBWC is implementing a multi-year plan to raise levees in critical areas using available funding. In Fiscal Year 2008, the agency was appropriated \$21.7 million for levee work in Texas and New Mexico—a significant increase over recent years when annual appropriations were \$2–3 million.

Finally, the USIBWC also has been coordinating with CILA on data collection and modeling. The goal is for both countries to use the information to determine flood control system needs and prepare plans for improvements.



Natural disasters can trigger incidents such as hazardous materials spills. To support transborder capacity to respond to disasters, the U.S. Environmental Protection Agency conducts hazardous materials response training with Mexican first responders. Shown: training session in the City of Acuna, State of Coahuila, Mexico (across the border from Eagle Pass, Texas). Participants included officials from the local fire department, hospital, public works department, police department, and nonprofit groups such as the Red Cross. On stage are several members of the audience dressed in different levels of personal protective equipment. (Source: Valmichael Leos, U.S. Environmental Protection Agency)

Border 2012 Program

As the Board discussed in its Tenth Report (*see pages 32–33*), the Border 2012 program and its Emergency Preparedness and Response Border-Wide Workgroup (EPRBWWG) have played crucial roles in U.S.-Mexico binational emergency prevention, preparedness, and response related to discharges of hazardous substances. During 2007, completion of one of the objectives of Goal #5 (Emergency Preparedness and Response) of the Border 2012 program was marked by the signing of the 14th and final Sister City Contingency Plan.

Besides the activities of the EPRBWWG, Border 2012 has contributed in other ways to border-region preparedness for emergencies. These contributions include testing and updating the emergency notification system between Mexico and the United States and expediting cross-border responses for people and equipment under the Trusted Traveler Program. More generally, Border 2012 has strengthened partnerships between U.S. and Mexico officials at all levels, including Customs and Border Protection (CBP) within DHS, the U.S. Northern Command (NORTHCOM, a DOD asset), Protección Civil, the Mexican National Communications Center (known as CENACOM), and Aduanas (Mexico's counterpart to CBP). In fact, EPA, NORTHCOM, FEMA, USAID, Protección Civil, and the six northern Mexico border states currently are collaborating to enhance Mexican hazardous materials disaster response capabilities through training, exercises, and a "leave behind" equipment program.

The U.S.-Mexico Inland Joint Contingency Plan

In its Tenth Report, the Board also discussed the Joint Response Team and its work on the Inland JCP, both of which originated with Annex II of the La Paz Agreement. The 1999 Inland JCP establishes binational cooperative measures for preparing for and responding to hazardous substance incidents along the border. The EPRBWWG, in its role as steering committee of the Joint Response Team, currently is updating the 1999 JCP to reflect recent institutional changes and updates intended to ensure 24 hour/7 day a week notification capabilities on the Mexican side of the binational response notification system.

Perhaps ironically, although the Inland JCP could provide an effective framework for coordination of a binational response to a natural disaster, its authority is limited to releases of hazardous substances. Therefore, unless the effects of a natural disaster include the release of a hazardous substance, the need to respond technically is outside the domain of authority under the Inland JCP.

Sister City Agreements

As mentioned earlier in this report, communities that lie across the border from each other often have extremely close ties in the form of family, friends, and economic interdependence. In times of crisis, including natural disasters, these neighboring communities—sometimes called sister cities—have informally been coming to each others' aid for many years.

To further strengthen and systematize these existing municipal-level networks, the Border 2012 program has facilitated the development of Sister City Agreements. These agreements, which are drawn up by the communities themselves and jointly signed, function as binational joint contingency plans that describe how the communities will work together to plan for, respond to, and recover from emergencies. They are based on the framework for emergency preparedness and response established in the Inland JCP. In addition, they reinforce the close relationships among city mayors, fire chiefs, and other government officials from the United States and Mexico, as well as aiding in bridging changes in political administration.

Fourteen sister city pairs, home to 90 percent of the border population, originally were identified. On June 25, 2007, the last of the 14 originally conceived major Sister City Agreements was signed by the communities of El Paso, Texas; the Municipality of Juárez, Chihuahua; and Sunland Park, New Mexico.

Anecdotal information suggests that the Sister City agreements have facilitated improved collaboration across the border. Recently, for example, Mexican authorities in Reynosa used the communications protocol of their Sister City Agreement to notify McAllen, Texas, of a small oil spill that entered the waters of the Rio Grande. The communications protocol also was used by Protección Civil in Ciudad Juárez to notify the U.S. National Response Center about a plastics plant



Neighboring U.S. and Mexican communities along the border often have extremely close ties. To more effectively help each other in case of emergency, Sister City Agreements have been instituted by many of these communities and jointly signed. On June 25, 2007, the 14th Sister City Agreement was signed by the communities of El Paso, Texas; the Municipality of Juárez, Chihuahua; and Sunland Park, New Mexico. Shown, left to right: Roberto S. Hernandez R., Acting Mayor, Ciudad Juarez, Chihuahua; Ruben Segura, Mayor, Sunland Park, New Mexico; John F. Cook, Mayor, El Paso, Texas; and Stephen L. Johnson, Administrator, U.S. Environmental Protection Agency. (Source: U.S. Environmental Protection Agency)

explosion that had the potential to affect El Paso.

Despite their invaluable utility, Sister City Agreements largely are limited in scope. Most apply only to hazardous materials releases rather than all types of emergencies or disasters; however, many sister cities continue to respond to requests for aid regardless of whether or not they relate to hazardous materials. In several instances, they have informally relied on their contingency plans during events such as tornadoes and floods. Further, one sister city pair—Nogales, Arizona and Nogales, Sonora—has formally updated its 2006 plan to include an all hazards approach. Activation of the updated plan in August 2007 resulted in a binational response team that saved lives during the floods. Several other sister city pairings are revising their plans to include emergencies beyond hazardous materials releases, such as floods, hurricanes, and tornadoes. This group includes McAllen-Reynosa; Eagle Pass-Piedras Negras; Del Rio-Ciudad Acuna; San Luis-San Luis Rio Colorado; Cochise County-Naco; and Douglas-Agua Prieta. (Note: *Tohono O'dham Nation and other tribes also may be involved.*)

Because the Sister City Agreements are equivalent to Memoranda of Understanding, the U.S. and Mexican federal governments do not recognize the Sister City Agreements as binding. Therefore, for example, any agreement between the sister city communities to address liability issues are unenforceable. Their non-binding nature, however, allows for tremendous flexibility in fashioning the scope of the agreements, empowering communities to address their unique needs.

As noted in the Board's Tenth Report, one challenge in binational emergency preparedness and response coordination is obtaining liability coverage for first responders and their equipment during sister city activation. A lack of reciprocity between American and Mexican insurance companies has been cited as one reason. Liability coverage recognized by the respective government in which responders are operating is important because emergency responders operating in a foreign country are subject to the jurisdiction and liability of that country. In response to this challenge, EPA's Office of Emergency Management is investigating the feasibility of a pilot program to obtain insurance for U.S. local responders going into Mexico, but a more comprehensive solution is needed.

Another challenge is quickly getting equipment and personnel across the border during an emergency. After many binational exercises along the border, inconsistencies from "port of entry to port of entry" and from "sister city to sister city" were identified. EPA and CBP currently are collaborating to formulate a solution, such as a protocol and/or procedure that would be applicable "border-wide" for expediting the crossing of equipment and personnel across the border during a hazardous material incident.

Binational State-Level Contingency Plans

Contingency plans drawn up by neighboring states across the international border would complement the municipal-level Sister City Agreements; however, with the exception of one proposed plan—between the states of Arizona and its Mexican neighbor state, Sonora—no formal state-to-state agreements and plans for emergency preparedness and response exist.

In September 2007, the governors of the United States and Mexican border states issued a joint decla-

ration at their XXV Border Governors Conference (*see Introduction*). The joint declaration included a number of items directly related to emergency planning and response in the border region. The governors agreed to: (1) carry out a functional binational agroterrorism exercise; (2) create a General Plan for Border Security, using as a basis the experiences and success cases shared by the member states of the Binational Border Security Worktable, especially those actions related to information exchange; the interoperability of real time voice, data, and video communications; and programming joint operations and joint training programs for both sides of the border; (3) train first responders in the border region on issues related to an influenza pandemic in coordination with the health committee; (4) develop a Five-Year Binational Emergency Response Strategic Plan that will include prevention, preparation, response, and recovery; and (5) develop a Memorandum of Understanding for mutual help in the event of emergencies among the 10 border states. The declaration includes the following statement: “We recognize the need to grow within a platform of regional cooperation, with the appropriate participation of government, to intensely promote the development of a border and communities that can withstand disasters, while taking full advantage of existing capacities.”

Informal Binational Cooperation

Local border-community officials often rely on more informal traditional practices and personal relations to marshal necessary binational cooperation to address emergencies in the absence of comprehensive and agile formal U.S.-Mexico agreements. Two cases from the Texas-Mexico border illustrate this point. In April 2004, flash flooding in the Mexican border town of Piedras Negras, population 200,000, caused the Río Escondido to rise 25 feet, trapping residents on rooftops. When Mexican army officials declined to ask for help from the United States, insisting it was not necessary, the mayor of Piedras Negras personally asked CBP to provide helicopters for search and rescue. CBP sent two helicopters and rescued 14 people trapped on rooftops.

Three years later, in April 2007, thunderstorms produced two tornadoes that struck the sister cities of Piedras Negras and Eagle Pass, especially the latter

(mentioned earlier in this report). To aid in rescue and recovery, the Mexican State of Coahuila, through its governor, and the Piedras Negras Mayor, offered assistance with clean-up efforts in Eagle Pass and surrounding Maverick County. With the help of CBP, nine dump trucks, a loader, three backhoes, and Mexican volunteers crossed the border to assist in clean-up efforts.

In California, informal cooperation also continues to play a key role in responding to natural disasters. For instance, after El Niño floods in the early 1990s and in 1998, the City of San Diego dispatched road crews and work vehicles to assist Tijuana in clearing its roads of mudslides and debris. More recently, during the summer of 2005, the governor of Baja California asked the California governor for assistance in extinguishing an out-of-control forest fire in Mexico’s Parque Nacional San Pedro Mártir. California officials then turned to the Border Agency Fire Council (*see Spotlight on Promising Partnerships section*) and its existing relationships with Mexican firefighting officials to immediately dispatch 60 state firefighters and a fleet of vehicles to assist Baja California. In addition, in 2007, Mexican firefighters from Tijuana and Tecate aided in fighting the fires in San Diego County.

Enforcement settlements also can provide a mechanism to foster binational cooperation. For example, the San Diego County Department of Environmental Health received administrative settlement funds to purchase hazardous materials emergency response equipment, and then transferred the equipment to the Tijuana Fire Department for emergency response purposes.

These cases illustrate the importance of local cross-border relationships in addressing incidents. They also suggest that there is need for more assistance by state and federal governments to facilitate local responses.



Next Steps for Binational Institutions/Policies

Below, a number of next steps are recommended to improve transborder response to natural disasters. They address concerns that present response capabilities need to be upgraded to cover the binational border region to adequately protect the U.S. border communities. Although they demonstrate that significant prog-

ress can be made through local and state initiatives, ultimately, the two federal governments need to make emergency response to natural disasters seamless in the border area. This may require both administrative arrangements and legislative initiatives.

Establish an all disasters binational contingency plan. To seamlessly respond binationally to a binational disaster of any type, many jurisdictional levels on both sides of the border need to be engaged. The binational federal jurisdictional structure necessary for full engagement currently is limited, however. For example, the 1980 U.S.-Mexico Agreement on Cooperation During Natural Disasters has yet to be fully implemented. In addition, the La Paz Agreement (the basis for Border 2012 and the Emergency Preparedness and Response Border-Wide Workgroup and the Joint Response Team/Joint United States-Mexico Contingency Plan for Preparedness and Response to Environmental Emergencies Caused by Releases, Spills, Fires, or Explosions of Hazardous Substances in the Inland Border Area [Inland JCP]) is an agreement for the protection and improvement of the environment in the border area. The focus of this agreement has been to coordinate government efforts for man-made pollution sources, not threats or harm imposed by natural or other disasters, which necessitate a more complex response and the involvement of numerous more entities. Therefore, developing a binational emergency response coordination mechanism that covers all types of disasters presents a notable challenge. That said, it is an important goal that will take time and utilization of existing U.S.-Mexico agreements may not be able to achieve it.

Fully implementing (and, if necessary, broadening to provide additional authority for U.S.-Mexico natural disaster contingency planning) the 1980 U.S.-Mexico Agreement on Cooperation During Natural Disasters, mentioned earlier (*see also Security and Prosperity Partnership under the Government Partnerships section*), would be a great step toward ensuring the border area is prepared for and capable of binationally responding to a binational natural disaster. Full implementation of the 1980 Agreement—or a future federal binational emergency response mechanism that covers all types of disasters—could build on relationships and regional and local initiatives, such as those developed under

Sister City Agreements and the Inland JCP, already in place.

Clarify and expand Sister City Agreements.

Encourage sister city communities to expand both the substantive and geographic scope of their Agreements. Substantive scope could be expanded to include pollution, natural events, or other incidents. Expansion to include all hazards is extremely effective because local governments take ownership of the initiative, leveraged funds from other sources become available, and city governments engage additional levels of government such as county, state, and other local entities as pertinent to their areas, creating more comprehensive plans for emergency preparedness and response.

In addition, encourage sister city communities to identify institutional and policy challenges. Key among these challenges is to solve the liability/indemnification challenge and expedited border crossing challenges for emergency response personnel and equipment.

Develop additional sister state/border state contingency proposals and plans.

The Board endorses the excellent progress on the sister city contingency plans and encourages ongoing communication, planning, and exercises to improve their ability to respond to emergencies of all types. The Board also fully supports the recent joint declaration of the XXV Border Governors Conference and recommends that particular attention be given to natural disasters as the elements of the declaration are implemented.

Build prevention and minimization of damage measures into existing binational agreements.

For example, zoning codes can be developed to keep buildings/activities out of floodplains and stream channels. Building codes can be instituted to minimize impacts from earthquakes and fires. Landscape requirements can be used to create a “defensible space” around built up areas to protect against wildfires. Grading ordinances can be used to protect against landslides and minimize erosion/sedimentation/flooding of stream channels. Each city should identify key potential natural disasters and develop plans to prevent their impact and minimize the need to undertake costly responses. Such preventative approaches could be incorporated into an existing binational partnership to encourage

such front-end preventative actions to be taken on both sides of the border.

Strengthen both informal and cross-agency binational collaboration. Continue to work with U.S. Customs and Border Patrol within the Department of Homeland Security and its Mexican counterparts (e.g., Aduanas) to enhance capabilities for quick, cross-border emergency response mobilization. The Board supports the joint statement issued under the Security and Prosperity Partnership calling for progress in that arena. (These issues also were addressed in the Board's Tenth Report.)

To initiate cross-border assistance, triggers and organizational roles and responsibilities should be

established. Once assistance is initiated, equipment logistics and interoperability, command and control over personnel, and reimbursement of expenses and fund transfers must be defined more clearly. In regards to public affairs, messages must be clear and consistent for both countries. Cross-border evacuation plans should be developed. In looking forward, current initiatives at all governmental levels should be reviewed and coordinated in an effort to develop the same comprehensive, all-hazard approach to cross-border emergency management with Canada and Mexico as the United States practices domestically.



SECTION Three

Spotlight on Promising Partnerships

Note to readers: As in its past reports, the Board has assembled a sampling of projects and partnerships already underway that demonstrate how the issue it has identified for its report already is being addressed. Some have been in place for years, while others are new. In addition, other projects may be underway that are not included.

The purpose of including these partnerships is to highlight some of the good work already being carried out, identify possible templates to be replicated elsewhere, highlight some of the complexities, and reinforce the need for continued strategic support on the federal level for all types of partnerships that contribute to progress.

Note also that for this particular topic—managing natural disasters along the U.S.-Mexico border—several partnerships have been included that currently are limited in scope (e.g., cover only hazardous spills). The Board encourages policymakers to examine all effective emergency management projects to determine the possibility of broadening their scope to include natural disasters.

Finally, note that some partnerships already have been discussed in detail within the previous section on current institutions and policies and so are not listed below. These include initiatives such as the Sister City Agreements, the Border 2012 Emergency Preparedness and Response Border-Wide Workgroup, and the 1980 U.S.-Mexico Agreement on Cooperation During Natural Disasters.

Natural Disasters Government Partnerships

Border Liaison Mechanisms (BLMs). The BLM was created in the 1990s by the U.S. Department of State and Mexico's Secretariat of Foreign Relations to respond to the need for greater coordination at the local level between entities on both sides of the border. The mechanism brings together state and local entities on both sides of the border to discuss any issues of concern. Although some of the most active BLMs have been those between sister cities, such as Tijuana and San Diego, BLMs also exist between consulates that are not directly across from each other. For example, the U.S. Consulate in Nuevo Laredo not only has a BLM with the Mexican consulate in Laredo but also with the consulates in Del Rio and Eagle Pass.

Many BLMs have subcommittees for transportation, commerce, and safety issues that can serve as useful platforms for building positive working relationships as they apply to disaster response.

International Red Cross and Red Crescent Societies' Guidelines. In November 2007, the International Federation of Red Cross and Red Crescent Societies' International Disaster Response Laws, Rules, and Principles (IDRL) Programme submitted *Draft Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance* to the 30th International Conference of the Red Cross and the Red Crescent in Geneva, Switzer-

land. The IDRL Programme facilitates and supports the development of laws, rules, and principles to enhance the effectiveness of international disaster response. Its guidelines provide guidance to nations seeking to improve their domestic legal, policy, and institutional frameworks concerning international disaster response and recovery. Such guidelines may be of value to the governments of the United States and Mexico when considering gaps, needs, and frameworks for cooperation.

Security and Prosperity Partnership (SPP).

As mentioned in the Introduction to this report, on August 27, 2007, the Heads of State of the 3 countries issued a joint statement under the SPP that called for their nations to continue to work together to “better prevent, prepare for, and respond to disasters, either natural or man-made.” The statement calls for continuing to “define, develop, and coordinate appropriate responses to catastrophic incidents in North America and develop bilateral and trilateral protocols and procedures to manage the movements of goods and people, including emergency responders, across our shared borders during and following an emergency, and to improve communications among governments and between governments and industry, particularly during times of increased threat.”

“The consequences of catastrophic events often transcend national borders,” the leaders stated. “Preparation and planning can mitigate the impact of such events on people and our economies. Much work has been undertaken between our countries at national, subnational, and local levels to develop common approaches for responding to major incidents. We ask our ministers to continue this work and to address any obstacles preventing critical equipment, supplies, and personnel from being deployed expeditiously to those parts of North America where they are needed. We also ask them to develop procedures for managing the movement of goods and people across our shared borders during and following an emergency.” The Board recognizes the importance of this initiative and stresses the need to bring this to the level of implementation in the U.S.-Mexico border region.

Officials from relevant U.S. government agencies met at the working level in November 2007 to discuss how to implement the leaders’ directive on emergency management and preparedness. One of the recommended courses of action from this group was to update the two bilateral agreements that exist between the United States and Canada and the United States and Mexico on cooperation during disasters (*as discussed in the Binational Arrangements section*).



Natural Disasters University Partnerships

Many border region universities are conducting applied research on emergency management, including natural disasters. Following are several relevant examples.

Cover the Border Hazard Mitigation Plan.

Texas A&M International University, in partnership with the Rio Grande Institute, is sponsoring the development of a comprehensive Hazard Mitigation Plan for the cities and counties in a 10-county area of Texas. The effort is funded by a Pre-Disaster Mitigation Grant from the Federal Emergency Management Agency (FEMA). Major hazards will be identified, in-

cluding transboundary hazards, and a mitigation plan will be developed to address the hazards. The process has included significant public input from both sides of the border, including a meeting in Reynosa during 2007 with local Mexican officials and nongovernmental organizations.

Social Dynamics Modeling Project. New Mexico State University, in collaboration with Los Alamos National Laboratory, is using transportation modeling software to study evacuation behaviors and traffic congestion in a portion of El Paso where English frequently is not the native language of residents. Spe-

cifically, the partners are looking at how the method of delivering information about a threat affects human response and traffic congestion. The goal is to foster understanding of social dynamics in chaotic situations

so as to improve emergency response and evacuation procedures, including natural disasters.



Natural Disasters

Multi-Sector Partnerships

Federal Agencies, Local Organizations. Many federal agencies carry out their work related to natural disasters via the partnerships they already have established on a local level. For example, the U.S. Department of Housing and Urban Development (HUD) works with municipal water districts or water boards to discuss strategies to alleviate known flood areas affecting colonias and migrant/farmworker communities. In New Mexico, HUD staff worked with local partners to provide information on how the state provides funds for water, wastewater, and flood control. Partners in-

cluded officials from the Village of Hatch, the Town of Mesilla, the City of Sunland Park, and several non-profit and faith-based organizations, as well as Doña Ana County, FEMA, the U.S. Environmental Protection Agency, and the U.S. Department of Agriculture. After several meetings, Doña Ana County received funding to build a flood control levee and other infrastructure in the southern portion of the county as well as in the Village of Hatch.



Natural Disasters

Hurricane/Flood Specific Partnerships

El Paso Plan To Avoid Development on Arroyos. The city of El Paso Open Space Master Plan, adopted in 2007, identifies preservation of undeveloped arroyos as a high priority. The Plan recommends that drainage washes be left in their natural state to provide natural greenbelt areas in the city rather than channelizing them, as has been the traditional practice. It also proposes a change in subdivision regulations to require preservation of 75 percent of the land area of existing arroyos in undeveloped areas. An added benefit of this nonstructural flood control practice is that the approach also results in maintaining open space and greenbelts.

Lower Rio Grande Wildlife Corridor. In the Lower Rio Grande Flood Control Project in Texas, the USIBWC, in coordination with the U.S. Fish and Wildlife Service, has modified traditional vegetation man-

agement practices, establishing a “no mow” zone in the Rio Grande floodplain as a wildlife corridor. The region is home to various endangered species including two cats—the ocelot and jaguarondi. Restricting mowing in critical areas is part of an agreement that provides protection for wildlife while allowing other areas to be mowed as part of flood control project maintenance.

Rio Grande Canalization Collaborative Project. The Rio Grande Canalization Project is a water delivery and flood control project covering 106 river miles from Percha Dam, New Mexico, downstream to El Paso, Texas. The goal is to integrate flood control and conveyance functions with habitat restoration. The U.S. Section of the International Boundary and Water Commission (USIBWC; see *Binational Arrangements section*) is participating in a collaborative effort with project stakeholders, including the Elephant Butte Irriga-



The Rio Grande, which forms the U.S.-Mexico border for 1,254 miles, historically has experienced cycles both of drought and devastating flooding. Although overall rainfall in the region is relatively low compared to other parts of the United States, the rain often comes in brief, but intense, weather events, making flash floods common in the desert. Shown is Rio Grande flooding during 2005 at El Paso, Texas-Ciudad Juarez, Chihuahua. (Source: International Boundary and Water Commission, U.S. Section)

tion District, World Wildlife Fund, and Environmental Defense along with a 30-member stakeholder group. Technical work is being conducted by the U.S. Army Corps of Engineers under contract to the USIBWC. The project also entails modeling environmental flows for floodplain restoration, considering safe harbor agreements whereby a landowner who voluntarily restores habitat for endangered species will not be penalized with future restrictions on land use or water operations, development of habitat conservation plans, and consideration of potential use of water for environmental purposes through Special Water Users Associations.

A variety of alternative approaches are being examined. In addition to raising levees, the USIBWC would consider control of invasive species (especially salt cedar), modification of grazing leases along the Rio Grande as an erosion control strategy, planting of native riparian species, stream bank reconfiguration to facilitate over bank flows and restoration of native plant species in the floodway, opening of river meanders and modification of arroyo mouths to increase habitat diversity, arrangements for seasonal pulse flows of water

to allow for over bank flows for environmental purposes, and establishment of voluntary conservation easements beyond the federal right of way.

State-Level Response to Hurricane Dean, August 2007. Each of the four U.S. border states has developed emergency response plans that are put into action when natural disasters strike. For example, as Hurricane Dean made its way through the Caribbean becoming a Category 5 storm and moving westward, the State of Texas, as well as FEMA, worked with local authorities along the coast to prepare for a massive evacuation of Lower Rio Grande Valley residents.

On August 17, Governor Perry issued a disaster declaration and requested federal assistance from the President, which was granted on August 18. Preparations included: mobilization of 4,000 Texas Army National Guardsmen and 3,000 school buses to evacuate Lower Rio Grande Valley residents; airplanes to move 1,800 nonambulatory residents; 47 helicopters; 250 boat crews (from just one agency); and fuel stations to assist motorists fleeing to San Antonio. Fortunately for Texans, the hurricane changed course, but the state took its preparations seriously.

Tijuana River Flood Warning System. Officials from the United States and Mexico signed an agreement in 2003 for an Integrated Binational Flood Warning System in the Tijuana River Watershed. The purpose of the project is to provide real-time rainfall and stream flow information to emergency officials on both sides of the border to enable effective decision-making during floods in the Tijuana River Watershed. The flood warning system is the first of its kind along the U.S.-Mexico border.

Project participants are from a broad spectrum of organizations: USIBWC and the Mexican Section of the IBWC (*La Comisión Internacional de Límites y Agua, CILA*); Mexico's National Water Commission (*Comisión Nacional del Agua*); the U.S. National Weather Service; County of San Diego; City of San Diego; the Civil Protection agencies of Baja California, Tijuana, and Tecate; State of California Department of Parks and Recreation; San Diego State University; and El Colegio de La Frontera Norte. In addition, the National Oceanic and Atmospheric Administration provided early leadership.

U.S.-Mexico Agreement for Rio Grande Maintenance at El Paso, Texas-Ciudad Juárez, Chihuahua. Following the flood in the Rio Grande at El Paso, Texas-Ciudad Juárez, Chihuahua, in August and September of 2006, USIBWC and CILA developed a plan to maintain the river channel and floodways. The Joint Report of the Principal Engineers, signed in 2007, identifies critical areas where the river chan-

nel has problems conveying normal and flood flows as a result of sediment, vegetation growth, and poor condition of the flood control levees. The agreement specifies the river reaches where each section will be responsible for desilting activities, levee repairs, and other improvements.



Natural Disasters

Earthquake and Wildfire Specific Partnerships

Border Agency Fire Council (BAFC). The BAFC was formed during the 1995 fire season in the San Diego-Baja California border region. It includes more than 30 organizations representing fire protection, law enforcement, elected officials, the health sector, natural resource managers, and others from both sides of the border. BAFC meets quarterly and approximately every 6 weeks during the fire season. It operates under a mutual assistance agreement with Mexico that is facilitated by the U.S. and Mexican consulates in the region. BAFC has improved communications across the border, held many joint training exercises, implemented fire safety campaigns on both sides of the border, coordinated development and maintenance of fire breaks along the border, and jointly conducted prescribed burns along the border. BAFC also coordinates crossborder assistance for wildfires. For example, as mentioned earlier, in the fall of 2007, 60 Baja California firefighters crossed the border to help with the San

Diego County firestorm; previously in June 2006, 10 engines and crews from the California Department of Forestry and Fire Protection crossed into Baja California to support Mexican fire authorities for 6 days with a fire that burned 5,200 acres.

Golden Guardian Exercise. The Golden Guardian Exercise Series, first introduced in California in 2004, is an exercise program conducted annually to coordinate the activities of city, county, and state governments; first responders; volunteer organizations; and the private sector in response to potential acts of terrorism and natural disasters. The goal of the Series is to build on lessons learned from both simulation exercises as well as real-world events. The 2008 Golden Guardian Exercise will focus on the earthquake scenario.



Glossary of Acronyms/Terms

Aduanas	<i>La Administración General de Aduanas</i> (Mexico's Customs Agency)	HSPD	Homeland Security Presidential Directives
BLM	Border Liaison Mechanism (sometimes this acronym can also refer to the Bureau of Land Management)	HUD	Department of Housing and Urban Development (U.S.)
CBP	Customs and Border Protection (U.S.)	IAS	International Assistance System
CHIPS	Texas Colonia Health, Infrastructure, and Platting Status	IBWC	International Boundary and Water Commission
CILA	<i>La Comisión Internacional de Límites y Agua</i> (Mexican Section of the International Boundary and Water Commission)	IC Annex	International Coordination Annex
CLAM	<i>Comité Local de Ayuda Mutua</i> (Local Committee of Mutual Assistance)	Inland JCP	Inland Joint Contingency Plan
CNA	<i>Comisión Nacional del Agua</i> (Mexico's National Water Commission)	IDRL	International Disaster Response Laws, Rules, and Principles Programme
DFIRMs	Digital Fire Insurance Rate Maps	Marine JCP	Marine Joint Contingency Plan
DHS	Department of Homeland Security (U.S.)	NIMS	National Incident Management System
DOC	Department of Commerce (U.S.)	NRF	National Response Framework
DOI	Department of the Interior (U.S.)	NRP	National Response Plan
DOJ	Department of Justice (U.S.)	NWCG	National Wildfire Coordinating Group
DOT	Department of Transportation (U.S.)	OFDA	Office of Foreign Disaster Assistance
EPA	Environmental Protection Agency (U.S.)	SEGOB	<i>Secretaría de Gobernación</i> (Mexico's Secretary of Government)
EPRBWWG	Emergency Preparedness and Response Border-Wide Workgroup	SINAPROC	<i>Sistema Nacional de Protección Civil</i> (Mexico's National System of Civil Protection)
ESF	Emergency Support Functions	SPP	Security and Prosperity Partnership of North America
FEMA	Federal Emergency Management Agency (U.S.)	USACE	U.S. Army Corps of Engineers
GAO	Government Accountability Office (U.S.)	USAID	U.S. Agency for International Development
GSA	Government Services Agency (U.S.)	USDA	U.S. Department of Agriculture
HHS	Department of Health and Human Services (U.S.)	USIBWC	U.S. Section of the International Boundary and Water Commission

Business Report

Council on Environmental Quality Response to 10th Report

CHAIRMAN

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL ON ENVIRONMENTAL QUALITY
WASHINGTON, D.C. 20503

January 28, 2008

Dr. Paul Ganster
Chair, Good Neighbor Environmental Board
5500 Campanile Drive
San Diego, California 92182-4403

Dear Dr. Ganster:

I am pleased to respond on behalf of President George W. Bush to the Tenth Report of the Good Neighbor Environmental Board which focuses on "Environmental Protection and Border Security on the U.S.-Mexico Border". The focus of the report is extremely relevant and its thoughtful recommendations are much appreciated by President Bush and his Administration.

During the fall of 2007, CEQ staff raised the report's recommendations in discussions with representatives of the Department of Homeland Security (DHS), including United States Customs and Border Protection. We understand that DHS is now working more closely with other federal agencies, notably the Department of the Interior, on tackling the challenging related security and environmental issues on the U.S. Mexican border. These measures, including identification of regular field coordination and the appointment of a National Coordinator by the Department of the Interior to work with the Department of Homeland Security should help to implement a key recommendation in the Undocumented Human Crossings section of your report: "Strengthen communication and collaboration between security agencies and environmental protection agencies, including land management agencies, on both sides of the border."

Another area in which the Administration is moving forward relates to a recommendation in the Hazardous Materials Crossings section of your report: "Beyond ports of entry, resolve liability issues for cross-border emergency responders and provide targeted support that reflects the needs of border communities within the larger national strategic plan." Under the Security and Prosperity Partnership (SPP), the Presidents of Mexico, the United States, and Canada have agreed to better manage the movements of goods and people, including emergency responders, across shared borders during and following an emergency.

We look forward to continuing to work with the Board and to receive the benefits of the breadth and depth of the Board Members' expertise through the annual reports and other communications.

Yours sincerely,

James L. Connaughton

Recycled Paper

Comment Letter

**GOOD NEIGHBOR
ENVIRONMENTAL BOARD**

*Presidential advisory committee on
environmental and infrastructure issues
along the U.S. border with Mexico*

Chair

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August 2, 2007

The President
The White House
Washington, D.C. 20500

Dear Mr. President:

As your federal advisory committee on environmental and infrastructure issues along the U.S. border with Mexico, we write to express our great concern about continued insufficient federal support for building and maintaining healthy communities in this area, specifically, funding for water and wastewater projects. We wrote to you about this serious problem in May of 2003, and we are writing again because the situation has only worsened.

Much of the federal support for border environmental infrastructure currently is a line item in EPA's budget. This funding, widely known as the as the Border Environment Infrastructure Fund (BEIF), is provided to the North American Development Bank (NADB), which enables drinking water plants and wastewater treatment plants to be constructed in communities with limited resources along the U.S.-Mexico border. NADB leverages the BEIF funds with other funds to produce loans that are affordable to poor border communities. Unfortunately, this critically important BEIF appropriation has been drastically cut back in recent years, from a high of \$100 million in FY 97, decreasing to \$75 million in FY 02, and down to \$10 million in FY 08.

Through FY06, all of the funding received from EPA (approximately \$615 million) has been disbursed or obligated for badly-needed projects along the length of the border to produce improved environmental health for border residents. These projects and results include:

- 54 certified water and wastewater projects valued at \$1.4 billion using \$490 million in BEIF monies and directly benefiting seven million border residents, many of them colonia residents;
- Eliminating 300 million gallons **per day** of raw or inadequately treated sewage, equivalent to the wastewater discharge of 6.8 million people, or 1.6 million households;

Administrative support: U.S. Environmental Protection Agency,
Office of Cooperative Environmental Management, Mail Code 1601M
1200 Pennsylvania Ave. N.W., Washington, D.C. 20460

Comment Letter *(continued)*

- 16 water treatment plants had been built, some for communities that never had potable water before (as of March 2006); and
- In some cases, rates of waterborne diseases are now lower in the Texas border region than in the rest of the state.

Despite this progress by NADB and its partners, many communities remain without proper water and wastewater services. Border population growth and urbanization, stimulated by NAFTA trade and investment, has outstripped efforts to provide water and wastewater services to all border residents. A needs assessment carried out by the Border Environment Cooperation Commission (BECC) has identified additional specific projects totaling nearly \$1 billion that are needed to bring the border up to levels of coverage prevalent in the rest of the United States.

Some of the rationale for the extremely low FY 08 budget is that there are undisbursed funds for border water and wastewater projects using BEIF monies. Actually, these funds have been obligated by the NADB for projects certified by the BECC but have not yet been disbursed. This sort of lag between obligation and disbursement of funds is common in most large public works projects.

The North American Free Trade Agreement has benefited the entire nation, with U.S.-Mexico trade increasing at rates outpacing trade with the rest of the world. Yet ironically, the four U.S. states bordering Mexico have been saddled with many of the costs of NAFTA implementation such as saturated transportation infrastructure and increased air pollution. At the same time, border communities have not prospered as a result of NAFTA. Many border communities remain poor; for example, 2006 Census Bureau data show three Texas border counties (El Paso, Cameron, and Hidalgo) among the 10 counties in the nation with populations greater than 250,000 with the lowest per capita income. As the Board pointed out in its 2004 annual report, children in these communities may be especially vulnerable to health problems related to contaminated water, untreated or partially treated sewage, and a lack of safe drinking water.

To address this disproportionate impact, and to help build and maintain healthy border communities, we respectfully urge that you significantly increase U.S.-Mexico water and wastewater funding in the FY 09 budget to a level of at least \$100 million. This line item should remain at the \$100 million level each year for the next several years in order to bring the environmental infrastructure of border communities up to an acceptable level.

Comment Letter *(continued)*

We appreciate the opportunity to provide you advice on this critical policy issue and hope you will give it serious consideration. If it would be helpful, I would be happy to meet with your advisors and discuss the Board's views in more detail.

Sincerely yours,



Paul Ganster,
Chair

Note: The following current federal agency members have recused their organizations from the consensus process for this Comment Letter because of its subject matter related to funding: Department of Agriculture, Department of Health and Human Services, Department of Homeland Security, Department of Housing and Urban Development, Department of the Interior, Department of Transportation, Department of State, Environmental Protection Agency, and International Boundary and Water Commission, U.S. Section.

cc: The Vice President
The Speaker of the House
James Connaughton, Chair, Council on Environmental Quality
Stephen L. Johnson, Administrator, EPA
Rob Portman, Director, Office of Management and Budget

Comment Letter

**GOOD NEIGHBOR
ENVIRONMENTAL BOARD**

*Independent Presidential advisory committee on
environmental and infrastructure issues
along the U.S. border with Mexico*

Chair

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October 17, 2007

Mr. Jerry Clifford
U.S. National Coordinator
Border 2012 U.S.-Mexico Environmental Program

Dear Mr. Clifford:

The Good Neighbor Environmental Board (GNEB) appreciates the opportunity to provide feedback on Border 2012 at the mid-point of this important United States-Mexico program to protect and improve the environment of the shared region. As a partner in the border environmental policy process, GNEB hopes that our comments will be helpful in assessing the first five years of the program and planning for the next five.

Our comments will focus on the following issues: funding; measurement of progress; communication; continued involvement of state agencies; and successes of the Border 2012 program, including those that are hard to quantify such as increased levels of transborder cooperation. We also encourage direct communication between Work Group and Policy Forum leaders and border residents. Communication is a linchpin of the program, and we have more comments on this than any other issue.

First and foremost, as you and Administrator Johnson have seen during visits to the region, there is a tremendous need for basic environmental improvements on both sides of the border, and funding needs for the Border 2012 project are a serious concern for the Board. Over the last few years, the Office of International Affairs (OIA) has provided funding through the U.S. Environmental Protection Agency (EPA) Region 6 and Region 9 offices for Border 2012 grants. We understand that these funds may be greatly reduced in FY 08, which would be a great loss for the residents of the border region.

As you know well, Border 2012 grants made on either side of the border directly impact the quality of life of U.S. border residents. The immediate, positive domestic impact of Border 2012 grants makes them a unique funding source in EPA OIA's budget. These grants most often help

Administrative support: U.S. Environmental Protection Agency,
Office of Cooperative Environmental Management, Mail Code 1601M
1200 Pennsylvania Ave. N.W., Washington, D.C. 20460

Comment Letter *(continued)*

communities make basic environmental improvements that would otherwise be impossible. Border 2012 grants also support essential binational cooperation and public participation in the process. It is imperative that the federal governments of both nations continue to provide support to solving environmental problems of the border region. It is regrettable that Border 2012 funding has decreased from \$6.4 million in FY04 to a proposed \$4.6 million in FY08, a 27 percent drop.

As the latest binational border implementation plan under the 1983 La Paz Agreement, Border 2012 adopts measurable goals while expanding local, state, and tribal participation. The emphasis of Border 2012 on measurable results is important and depends on the availability of quantifiable indicators and underlying data. To this end, EPA and its counterpart Mexican agency, SEMARNAT, launched the Border 2012 indicators project to develop indicators of environmental progress. The Board applauds the progress made by the Indicators Task Force and the publication of the "State of the Border Region: Indicators Report 2005." GNEB urges EPA and SEMARNAT to continue to work to harmonize relevant U.S. and Mexican data.

In terms of evaluation of the Border 2012 program, the Board feels that the indicators report provides good metrics for this purpose, with one exception. The program has been extremely important in promoting a culture of transborder cooperation and public participation on environmental matters. However, the outcomes are often long-term and do not lend themselves to mechanistic quantification. Nonetheless, it is important to recognize this important contribution of Border 2012.

Border 2012 has been quite successful in incorporating state and local stakeholders into the program. U.S. and Mexican state environmental leaders serve as co-chairs of the four Regional Work Groups, and staff from state environmental agencies work with EPA and SEMARNAT and local communities to implement the program.

The Board feels that it is important to continue to nurture open communications with state environmental agencies and that state personnel should continue to be actively involved in all phases of the Border 2012 program. This is especially true because state environmental agencies have played a very active role, and Border 2012 has institutionalized cooperation by federal entities on border environmental matters. One important result has been continuity in binational environmental cooperation, even with changing Presidential administrations in Mexico.

In communities all along the border, Border 2012 has facilitated local participation and the development of regional and transborder networks of environmental stakeholders. Through the development of local media-based task forces, Border 2012 incorporated existing environmental efforts. It also has provided modest resources for meetings, coordination, and translation, which stimulated the emergence of robust local binational task forces that depended upon local interest and initiative. There are a number of successful examples, including the San Diego-Tijuana Emergency Preparedness and Response Task Force and the Tijuana River Watershed Task Force.

Comment Letter *(continued)*

Another significant achievement of Border 2012 has been in the area of promoting and institutionalizing transborder cooperation on environmental matters. Border 2012 has had an important positive impact on the culture of cooperation on border environmental matters. At the local level, individual citizens, civil society organizations, industry groups, and local government representatives have developed the culture of participating with counterparts from both sides of the border and with state, federal, and tribal entities on matters of local concern in the task forces.

In terms of program assessment, the Board believes it would be useful for Border 2012 Work Group leaders and local residents to meet to discuss achievements/challenges. It is entirely likely that there will be a great divergence of views between the two groups, and steps could then be taken to see how to improve the program.

The organizational structure of Border 2012 is quite complex and additional efforts at facilitating communication among the many stakeholders would be helpful. That includes better communications with state and tribal partners, perhaps through more conference calls. Finally, Board members have noted the need to improve participation of Mexican partners in some phases of the program.

We would like to conclude by commending EPA and SEMARNAT and the other stakeholders involved in implementing the Border 2012 program. We see that progress is being made to solve border environmental issues but that in many areas, more work needs to be done. The Board reiterates its strong support for Border 2012 and the need for adequate federal resources to enable it to carry out its critical mission.

Sincerely,



Paul Ganster,
Chair

NOTE: The Good Neighbor Environmental Board representatives from the following federal agencies have recused their agencies from this Comment Letter due to funding language: Department of Agriculture; Department of Health and Human Services; Department of Homeland Security; Department of Housing and Urban Development; Department of the Interior; Department of State; Department of Transportation; the Environmental Protection Agency; and the U.S. Section of the International Boundary and Water Commission.

2007 Membership Roster

Note: Following listing includes all those who served on the Board during calendar year 2007. Asterisk (*) indicates those who completed their terms either during 2007 or prior to the release of the Eleventh Report on March 19, 2008. It does not include those new members appointed on March 15, 2008.

NONGOVERNMENTAL, STATE, LOCAL, TRIBAL MEMBERS

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